

# Summary of conclusions

If the British agricultural industry were to expand by 1972/3 in the manner indicated in our report—as we believe it could—the effect would be as follows:

## Output

A rise of about £345m (or 17 per cent) in annual gross output, and of about £185m (22 per cent) in net output, by 1972/3 in comparison with 1967/8, with further consequential increases thereafter.

## Resource costs

The cost of new capital assets on farms (buildings, equipment, machinery and drainage) plus lime, for the expansion as a whole, works out at £230m, most of which would be incurred by 1972/3.

The additional cost of other physical inputs (fertiliser, seeds, sprays, fuel and power, machinery repairs, etc) should build up to about £110m a year on completion of the expansion.

Manpower is likely to continue declining at least as fast as in the recent past; the expansion may not be attainable in full if the decline is at the high rates forecast.

## Import saving

Net import saving (*ie* cif cost less imported inputs) would be of the order of £220m a year on completion of the expansion.

## Commodity implications

In the arable sector, cereals production would increase by 3½m tons (over 1967/8), with smaller increases for most other crops.

In the livestock sector, the main increases (over 1967) in rounded terms would be milk (280m gallons), beef and veal (160,000 tons), pork (135,000 tons), bacon (170,000 tons), and poultrymeat (155,000 tons). Much of the beef would not be obtained until after 1972/3.

In the horticulture sector, there would be increases in glasshouse tomato production, in some field crops and in flowers, bulbs and nursery stock. Increases in top fruit production would not be realised until after 1972/3.

## Implementation of expansion

Appropriate incentives, related to the pace of expansion in the different sectors, would be required. Measures to sustain confidence, particularly by preventing the collapse of markets through badly phased imports, would also be necessary.

We stress that we see this as an integrated programme, particularly because of the inter-relationship between the proposed increase in production of animal feed and the additional livestock to consume it. We also draw attention to the assumptions and methods on which the study has been based and which are set out in the introduction to our report. To be achieved, our proposals will require

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## Introduction

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### *Basis of the study*

1 Before embarking on this study of the import saving role of British agriculture by 1972/3,\* it was necessary to make certain broad assumptions. The two principal assumptions were that all import saving possibilities should be considered, whether or not they might conflict with Britain's present international commitments, and that, over the next five years, the industry would not become subject to the common agricultural policy of the European Economic Community.

2 The study starts from broadly the present balance of incentives between product groups and in no case have we thought it appropriate to postulate a large increase in the support level given to a particular product group such as would result in a substantial change in its price relationship to other domestic farm products. Similarly, we have not considered it appropriate to stipulate the precise levels of incentive that we think would be needed to achieve the production objectives we postulate. Thus, we have made no attempt to calculate the Exchequer cost that might be called for under the present system of agricultural support nor to consider whether any alternative system of support would be more conducive to agricultural expansion. These are primarily matters for consideration at the Annual Review.

3 What we have done is to examine the range of agricultural and horticultural products grown in the United Kingdom (including the Channel Islands), concentrating on those that appeared to offer particular scope for import saving. For each of the main foodstuffs we have studied demand projections for 1972/3 which took account of rising population and possible changes in personal disposable incomes. We then considered the possibilities of expanding home production within the ceiling imposed by total demand, looking first at the upper limits of the technical possibilities and scaling these down, as appropriate in the light of practical considerations, to reach what we believe to be a sound level of production at which to aim by 1972/3.

### *Methods of calculating costs*

4 For each product, we have estimated the capital costs and the annual variable costs (*ie* physical variable inputs) that would be involved and have then integrated them into a single programme. They represent the additional resources that would have to be moved into agriculture to achieve the expansion postulated. On the capital side, we cover the cost of such additional items as buildings and equipment, field machinery, drainage and lime. The variable costs consist mainly of the additional fertilisers, seeds, sprays, fuel and power and machinery repairs that would be required on farms, and they include the additional costs

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that would be incurred in obtaining higher yields from existing acreages. They do not include the consequential capital and variable costs that would have to be met beyond the farm gate, mainly in processing and distribution. Manpower has not been costed as the industry as a whole is not expected to require additional labour, but we have considered in some detail whether the expected rate of outflow of labour from agriculture would inhibit the degree of expansion we envisage. Similarly, we have not included a cost for land, as no net additional acres are expected to be brought in from other uses.

5 We must stress that this method of assessment is essentially concerned with the use of national resources. It cannot be simply equated with the costs that would fall on the individual farmer. In the first place, it covers only the cost of the physical resources involved and is not concerned with the financial means that would be required to pay interest on loans for the additional capital employed and to cover the work in progress that would result from the expansion of output. Moreover, although increased output of particular products may not require additional manpower or land when viewed from a national standpoint, they would have to take their share of these costs in the accounts of the individual farm.

#### *Shape of the report*

6 In the pages that follow, we state briefly for the three sectors of the industry the current situation on home production and imports, and continue with our broad observations on the outlook for each sector. We then set out the views we have reached about the possible pattern of British agriculture by 1972/3 and the contribution it could make to import saving. A chapter is devoted to manpower, and a further chapter contains certain observations of a general economic nature which are pertinent to the study. We complete Part 1 of our report with a statement about the conditions necessary for the implementation of our proposals for expansion. In Part 2 we publish the more detailed reports on individual products: these reports were prepared by the three supply groups and we have relied heavily on them in reaching our own conclusions.

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### **Current situation**

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7 At present, agriculture produces about 3 per cent of the gross domestic product and employs a similar percentage of the working population. In value, its products approach £2,000m a year at farm gate prices (including deficiency payments). About half of United Kingdom requirements of food and feeding-stuffs, however, are still imported at a cost of about £1,600m. Some imported food could not, of course, be grown here. Excluding such produce, the import bill is of the order of £1,000m (including £70m for hard wheat, for which substitutes cannot readily be produced in this country).

8 For the main agricultural commodities, support currently takes the form of guaranteed prices linked with deficiency payments, and there are direct farming grants to encourage greater productivity. There are no price guarantees for horticultural produce: protection is mainly in the form of fixed-rate duties and, in isolated cases, quota restrictions and there is some financial and other support to encourage efficiency. Further information on these aspects is contained in the *White Paper Annual Review and Determination of Guarantees 1968* (Cmnd 3558) and in recent evidence to the House of Commons Select Committee on Agriculture.

### *Farm crops*

9 In recent years, the arable sector has contributed about 20 per cent of the total value of sales off farms in the United Kingdom, their worth in 1967/8 being forecast at £384m (including deficiency payments). But this method of assessment provides an inadequate measure of arable production, since a sizeable proportion of the crops grown—particularly cereals and roots—are consumed on the farm and are not included in the value of farm sales. When an estimate is included for this additional production, the total value of arable production in 1967/8 is considerably higher.

10 Imports in 1966/7 of the main arable crops (cereals, flour, sugar, potatoes, peas and beans) cost about £360m. Not all of these imports could be grown economically in Britain for climatic reasons or could readily be substituted by alternative home grown products; when these are excluded, there remains a substantial proportion that could be grown at home.

### *Livestock and livestock products*

11 Livestock and livestock products account for about 70 per cent of total farm sales. Their value has risen steadily in recent years and for 1967/8 it is forecast at £1,327m (including deficiency payments). Milk and milk products are the main item (£438m in 1967/8), followed by fat cattle and calves (£309m), fat pigs (£208m), eggs (£173m), poultry (£98m), fat sheep and lambs (£86m) and wool (£16m).

12 Imports of livestock and livestock products in 1967 cost about £787m. The main items were milk products (£203m), bacon and ham (£124m), wool (£100m), mutton and lamb (£69m) and beef and veal (£67m).

### *Horticultural products*

13 Horticultural products represent about 10 per cent of total farm sales. Including the industry of the Channel Islands, British growers produce just over half of the country's supplies of fresh vegetables, fruit, and flowers and nursery stock. In 1966/7, total supplies were valued at £384m, of which £179m was in respect of imported produce. A substantial proportion of these imports, *eg* citrus fruit, bananas, grapes, out of season apples and winter tomatoes, cannot be grown economically in Britain for climatic reasons; if these are deducted from the import total, there remains a figure of up to £45m representing the value of imported produce suitable for production in the United Kingdom.

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## **General outlook**

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### *Arable farming*

14 Arable farming in Britain during the last two decades has been characterised by increasing production in all the major crops (taking cereals as a single crop). Even in those crops that have remained stable in acreage or have shown a contraction, production per acre has increased and the whole expansion has been achieved with a shrinking labour force.

15 We have devoted considerable attention to the interaction of the two principal factors, acreage and yield per acre. The total tillage acreage (*ie* the area devoted to the cultivation of crops other than grass) is not normally subject to short-term fluctuations of any magnitude, but in times of national crisis considerable expansion of tillage acreage has been possible at the expense of grass. We have noted that, although the tillage acreage has been increasing slowly in

recent years, the 1967 figure is still 2m acres below the peak wartime acreage reached in 1943 and 1944. Moreover, there are areas now ploughed out which remained under grass throughout the war. We are therefore satisfied, on this and other evidence, that the economic limits of expanding tillage have by no means been reached.

16 The second factor—yield per acre—is highly important in judging the extent to which additional land might usefully be brought under cultivation. It is even more important in terms of the land already devoted to crops since this is where the highest level of expertise already exists. There can be no doubt, for example, that the yield potential of available varieties in any crop is still not being fully obtained; witness the marked difference in yields that are being obtained by different growers on similar types of land. In spite of the fact that British agriculture is using about four times as much fertiliser as it was twenty-five years ago, it is known that the average application of nitrogen, for example, is still below the optimum for some crops. We believe that national average yields could be raised significantly by improved fertiliser application according to requirement in different areas and related to soil type. Similarly, there is need for more widespread application of land drainage if the maximum potential is to be realised.

17 Although we do not expect there to be radical changes in crop husbandry during the next five years that would bring about a material improvement in yields, there is evidence of a steady improvement in efficiency. Moreover, there are already new varieties of some crops coming into cultivation that promise a significant contribution to yield improvement, but much will depend on the extent to which the plant breeder can achieve a better control of the disease situation, as with the leaf diseases of cereals.

18 One of the major causes of yield loss is the continuous growing of cereals. We recognise the attraction of this system in raising the level of grain production but must also stress the associated hazards due to soil-borne diseases, grass weeds and deterioration of soil structure. There are known methods of combating some of these diseases, and new methods will no doubt emerge, but we believe that, at least for the foreseeable future, the break crop must be considered the most practicable method of control. Moreover, striking improvements in yield are shown by subsequent cereal crops. In Part 2 of our report we examine the principal break crops, other than grass, and would advocate that increased interest be taken in these crops, by growers, advisers and research workers.

19 We must also stress the importance of paying attention to the needs of processors of arable crops, both in respect of quality of output and in marketing arrangements. We have heard certain strictures on the suitability and quality of some home-grown products for processing; without accepting all of the strictures, we readily recognise the need for close attention to be paid to the quality of produce. Much has been achieved—in malting quality in barley, baking quality in wheat, and root quality including juice purity in sugar beet—largely as a result of close collaboration between plant breeders and processors. We believe such collaboration to be essential and recommend that it be strengthened and extended to all crops. It is also important that growers' marketing arrangements should have regard to the processors' needs, for example, by making home-grown cereals available to millers and compounders on a continuing basis throughout the year and for potato processors to have a long-term assurance of adequate supplies of suitable potatoes. It is only by such means, and through a mutual effort on the part of farmers and processors to appreciate each other's problems, that it will be possible to make the maximum contribution to import saving.

### *Livestock farming*

20 In animal production, as in other branches of farming, there are continual changes, based on new knowledge and materials which create new production horizons. Sometimes these changes can be spectacular, as they have been in egg and poultrymeat production, where better control of the environmental needs of stock together with the evolution of more productive hybrids, has, in a period of about fifteen years, increased the efficiency of feed utilisation in commercial poultry units by at least sixty per cent. In other cases changes may not be dramatic; nevertheless, over a period of time they become substantial. This can be illustrated by the contribution artificial insemination is now making to the genetic potential of the national dairy herd, reflecting a gradual application of knowledge created through advances in the science of population genetics.

21 We cannot prophesy changes over the next few years in the sheep and cattle industries that would match those that have taken place in the poultry industry. But there can be substantial technological and economic changes which would make these branches of animal production more competitive with alternative sources of supply. This is being demonstrated by the pig industry, which is making rapid progress and will continue to do so.

22 Unquestionably the trend to greater specialisation in animal production is an important factor in increasing both efficiency and output. This again is one of the lessons of the poultry industry. Specialisation in itself creates more clear-cut production objectives and usually economies of scale. It also reduces the breadth of the individual farmer's technological commitment and generally results in a concentration on the enterprises for which both farms and farmers are best suited. This may be illustrated by the reduction in the number of milk selling farms, and the compensatory increase in the size of dairy herds, which has been accompanied by improved efficiency of land, capital and labour use.

23 Any increase in livestock production that has an appreciable import saving function must be accompanied by a substantial improvement in the efficiency of grass production and utilisation. If arable production is to continue expanding, as seems likely, there will be increased pressure on the remaining grass. It will not only be necessary to make good the nutrients lost by ploughing out the grass but also to make a substantial contribution beyond this to cater for the needs of expansion in numbers of ruminant livestock. Fortunately there is no physical barrier to such a development: an increase in stocking intensity on grassland is not only a direct means of securing higher livestock production, it also acts as a spur to the adoption of established methods that result not only in a greater production of grass nutrients but also in more efficient utilisation. We have paid close attention to these matters in assessing the acreages that would be required in expanding the main types of ruminant livestock production, and we believe that the acceleration in improvement in stocking rates which would be necessary would be more likely to be obtained in a climate of expansion induced by a recognition of agriculture's import saving role. There is, however, a managerial barrier to the utilisation of extra grass which higher application of fertiliser can produce, and heavier capital investment is also necessary. Basically the problem is to apply existing knowledge and materials and to create an economic climate which gives producers the confidence to make the necessary effort and investment.

### *Horticulture*

24 Although it represents only one-tenth of the total value of farm sales, horticulture tends to be more diversified, and its different sectors more specialised and self-contained, than the different sectors of farming. In spite of uncertainty

about the future in some parts of the industry, there are encouraging signs that growers are adapting to new techniques and changing economic factors. This is exemplified by the production of tomatoes where, after a period of declining production, the industry is regaining its share of the market and, by modernisation of glasshouses, has become more competitive.

25 The location of the industry in the past has been largely dependent on the availability of suitable soil and climate and on proximity to markets. These factors have tended to change in relative importance in recent years and there have been major developments with particular crops in particular areas; for example, the growth of cauliflower and narcissus production in Lincs. (Holland) and carrots in Norfolk. In the other direction, there has been the decline in glasshouse production in the Lea Valley, which might well have proceeded faster if growers there had not been hampered by planning difficulties in disposing of their holdings and re-establishing themselves in areas where production conditions are more favourable.

26 The movement of glasshouse growers away from the Lea Valley reflects a general drift of the industry from the vicinity of towns into areas of high light intensity, which is most favourable along the south coast, though in the longer term, developments in the control of micro-climates in glasshouses may lessen the dependence of the industry on natural climatic advantages. Many market gardens are likely to remain close to urban centres and meet a local demand for fresh produce, but developments in distribution and a fuller understanding of the optimum requirements in soil and climate of individual vegetable crops may increasingly lead to their being grown on a larger field scale, the resultant advantages of mechanisation and higher crop yield being of greater importance than proximity to market.

27 Improvements in marketing must continue to be a prime objective in the industry. It is, however, likely to remain a feature of horticulture that, at certain times, market returns may not fully cover costs of production. For example, prices of crops with a long marketing season tend to fall as the season advances, when they may yield little or no profit. Nevertheless, they will be marketed so long as the costs of gathering and marketing are covered. To compensate for these low returns, the grower relies on higher prices at other times of the year—usually at the beginning of the season—to ensure a profit on his operation over the year as a whole. Similarly, crops with a shorter marketing season are liable to gluts if favourable weather concentrates the ripening of the crop, and for these crops growers need years with high profits to offset years when market returns do not fully cover costs of production.

28 We have noted three particular causes of concern among horticulturists that affect their attitude to expanding production. There is first the uncertainty over membership of the European Economic Community and its consequences; secondly, the effects of the steady erosion by inflation, since they were last adjusted in 1954, of the fixed-rate or specific-duty tariffs which provide the industry's principal means of protection; and thirdly, the ineffectiveness of the present anti-dumping legislation. A fourth factor, which has only recently developed and is causing concern to the industry, is the considerable impact of the Transport Bill now before Parliament.

29 The long-term viability of the industry is also heavily dependent on the continuous application of research in all its aspects. Among the more important subjects for scientific research are the breeding of new and improved plant varieties better suited to our climatic conditions and capable where possible of being harvested mechanically; a better understanding of the relationship between



environment, site and crop; the control of pests and diseases, and the development of the most effective production techniques. These studies will need to be linked to research into the economics of production, changes in demand and improvements in marketing. Moreover, if technological advance is to be applied effectively, adequate facilities are needed for comparisons to be made between crops, varieties and systems so that the most effective types of management may be determined and demonstrated.

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## Commodity proposals and their implications

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### *Summary*

30 Because of the inter-relationship between the arable and livestock sectors of agriculture, we view our proposals for expansion as an integrated whole. The total effect would be to increase gross agricultural output in 1972/3 over 1967/8 by about £345m; the corresponding figure for net output is about £185m. In the paragraphs that follow we describe the changes we envisage for particular products. In Table 1 we summarise the changes in livestock numbers (other than broiler chickens and turkeys) that would be involved and in Table 2 we set out the changes in production in terms of individual commodities. We then integrate the proposals for particular products and in Table 3 we list the estimated cost that would be involved and the import saving that would be achieved. Table 4 sets out the changes in acreage.

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Table 1 Proposed changes in livestock numbers/'000s as at June

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	1967	1972	Change
Dairy cows	3214	3514	+300
Beef cows	1141	1441	+300
Pig breeding herd	824	1174	+350
Sheep breeding flock	14223	14423	+200
Laying flock (excluding hatcheries)	52250	52250	—

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### *Cereals*

31 We believe that, in the arable sector, cereals production offers by far the greatest scope for import saving. An increase of 3½m tons over the next five years to a total production of 18m tons should be well within the capability of British agriculture. There is a marked degree of interchangeability both in production and use between the different cereals, depending mainly on price, but we believe that the interests of import saving would best be served by giving greater encouragement to the production of wheat than to barley. We also favour a slightly higher acreage of oats because of its value as a break crop. Ideally, therefore, the additional 3½m tons of cereals should consist of nearly 2m tons of wheat (½m tons of it quality wheat for milling and the remainder for animal feed), over 1m tons of barley and ½m tons of oats. The feed wheat, barley and oats would be used partly to reduce the existing level of imports of maize, sorghums or feed wheat, but mainly to meet the feed requirements of an expanded livestock population as well as for seed. Any decrease in the quantity of barley exported (1.1m tons in 1966/7) would add to these extra supplies on the home market.

Table 2 Proposed expansion of production

<i>Arable</i>	<i>1966/7</i>	<i>1967/8</i>	<i>1972/3</i>	<i>Increase over 1967/8</i>
	<i>million tons</i>			
Wheat	3.4	3.8	5.7	1.9
Barley	8.6	9.2	10.4	1.2
Oats and others	1.2	1.5	1.9	0.4
<b>Total cereals</b>	<b>13.2</b>	<b>14.5</b>	<b>18.0</b>	<b>3.5</b>
Sugar beet	6.5	6.8	7.5(a)	0.7(a)
Potatoes	6.5	7.1	7.0	-0.1
Peas and beans for human consumption	0.37	0.44	0.51	0.07
Beans for stockfeed	0.12	0.17	0.54	0.37
Oilseed rape	0.00	0.02	0.06	0.04
Herbage and brassica seed	0.02	0.02	0.03	0.01
<i>Livestock</i>	<i>1966/7</i>	<i>1967</i>	<i>1972/3</i>	<i>Increase over 1967</i>
	<i>thousand tons or as stated</i>			
Milk (m gallons)	2409	2498	2780	282
Eggs (m dozen)	1203	n a	1283	80(b)
Beef and veal (home bred slaughter)	732	749	907(d)	158(d)
Pork	572	552	687	135
Bacon	198	202	372	170
Poultrymeat	424	444	600	156
Mutton and lamb	263	258	263	5
<i>Horticulture</i>	<i>1966/7</i>	<i>1972/3</i>	<i>Increase over 1966/7</i>	
	<i>thousand tons or £m</i>			
Tomatoes (c)	148	163	15	
Culinary apples	(c)		25(d)	
Pears	41	66(d)	25(d)	
Onions	60	100	40	
Cauliflower and broccoli	325	345	20	
Flowers, bulbs, nursery stock (c)	£45m	£50m	£5m	

*Note:* Small additional quantities of glasshouse lettuce and strawberries are also proposed.

(a) After 1974

(b) Increase over 1966/7

(c) Output abnormally low; expansion based on additional acreage

(d) After 1972/3

(e) Includes Channel Islands supplies to the United Kingdom

32 An increased production of this magnitude would require 1.7m acres over the June 1967 acreage; we believe that there is sufficient land of a quality suitable to carry such an expansion. Capital costs are estimated at some £36m in total during 1967/8-1972/3, and variable costs at £25m a year. The total net import saving by 1972/3 would be of the order of £79m per year.

#### *Potatoes*

33 In normal years, the United Kingdom has been virtually self-sufficient in maincrop potatoes, imports being confined mainly to new potatoes. There is, however, a small but growing import of potatoes in processed form. Total demand for potatoes is relatively stable, but within the total figure there is an increasing switch from raw potatoes to the processed forms—dehydrated potato, canned new potatoes and frozen products. More potatoes are also being used for crisps, and it is important here that growers should extend the storage season to obtain a greater share of this market. Through higher yields and improved handling, we calculate that it should be possible to remain self-sufficient in maincrop potatoes in 1972/3 on an acreage reduced by 75,000, and with £4m a year less in variable costs. But we must stress the need for growers to organise the marketing of potatoes for dehydrating and canning, and for manufacturers to utilise domestic supplies of varying grades. There are already encouraging signs that they will do so. If they fail, processed imports are likely to rise to at least £10m by 1972/3 and sales of raw potatoes to fall correspondingly.

#### *Sugar beet*

34 The British grower produces about one-third of the total sugar used in the United Kingdom and is capable of growing more. But because of the Commonwealth Sugar Agreement (CSA), which runs to 1974, we suggest that over the next five years only the growth in demand should be met from additional home production. This amount seems likely to be small, yielding an import saving of £3m a year at Commonwealth negotiated prices for an additional variable cost of £0.3m a year. We believe, however, that well before the present term of the CSA ends, consideration should be given to increasing the home producers' share of the market. If at that stage an additional 45,000 acres were allocated to sugar beet, capital costs on the farm would be negligible provided the additional supplies came from existing producers. (There would, however, be need for a new factory, costing some £11m.) Variable costs would be about £1.2m a year. The total net import saving, including production from this higher acreage, would be £7m a year at Commonwealth negotiated prices (£3m at current low world prices).

#### *Peas and beans for human consumption*

35 After a period of decline, production of peas and beans for human consumption has recently shown a slight recovery. Imports have, however, been running at a level of about £7m a year—£4m in respect of dried peas and the rest frozen peas and beans. We believe that the whole of these imports should be replaced by home production, the main obstacles being the reluctance of some processors to rely entirely on the home crop, and a shortage of freezing capacity at the material time of year. To meet the expansion envisaged, there would be capital requirement for machinery of £0.3m and an annual variable cost of £½m. The net import saving in 1972/3 would be nearly £7m a year.

#### *Beans for stockfeed*

36 The recent revival of interest in the growing of beans for stockfeed has been

stimulated by their value as a break crop for wheat. But beans also provide a useful source of starch and protein, and we have been told that the manufacturers blame price relationships with other raw materials rather than technical difficulties as the reason that currently prevents them from using beans in compound animal feeds. In view of the likely expansion in output of beans, we believe that the compounders would be well advised to give closer attention to the use of this material in the formulations. Fortunately, demand is buoyant at present because of a thriving export trade which is taking almost half of the beans produced. We have concluded that there might well be 500,000 acres down to beans by 1972/3 but have based our calculation on 400,000 acres, yielding 540,000 tons of beans. The total capital cost of this level of expansion would be £1.0m; variable costs would be £4½m a year, and the resultant net import saving would be over £12m a year.

#### *Oilseed rape*

37 The increasing need for break crops has also been reflected in the recent acreage of rape grown for seed. This crop competes with rapeseed imported for crushing—on which no import duty is payable—as well as with other imported edible oils and the current return to the home producer is unattractive. There are two main outlets for rapeseed oil—a higher-priced market for a limited quantity of liquid oil, and a lower-priced market for a larger quantity of hydrogenised oil. We believe that if home-grown rapeseed were encouraged to the level where it would meet the full demand for liquid rapeseed oil but avoid falling into the lower-priced market, there would be a useful benefit from both the agronomic and the import saving standpoints. This would require 65,000 acres down to rape which, at the estimated 1972/3 yield, would produce 25,000 tons of rapeseed oil. Crushing capacity is currently available and other capital costs would be negligible. Variable costs would be £½m a year and the net import saving would be about £1½m a year.

#### *Herbage and brassica seeds*

38 Imports of these seeds, estimated at £2½–£3m in 1966/7, are roughly equivalent in value to home output. A decline in herbage seed production in recent years gives rise to some concern and we believe a modest expansion of up to 20,000 acres by 1972/3 would be justified. Little in the way of additional resources would be required: the net import saving would amount to about £1m annually.

#### *Cattle*

39 The inter-relationship of the dairy and beef industries in Britain is complex and highly important since a substantial proportion of domestic beef production is a by-product of dairying, either in the form of cull cows or fattened stock which are surplus to replacement needs. This does not mean, however, that the dairy industry should be expanded merely to produce more beef stores. The additional milk produced through such an expansion would, under present arrangements, have as its main outlet the manufacture of butter, which is the least remunerative of the uses of milk.

40 We believe, however, that there are relatively unexplored possibilities of creating a highly efficient sector of the dairy industry which is seasonal in nature and aims to secure the maximum *in situ* utilisation of grass and other forages. This would be particularly appropriate to western areas with a prolonged growing season and a relative absence of summer droughts. Such a development

would not only ensure the best possible coincidence of the curve of pasture growth with the nutritive needs of the herd, but could also bring considerable economies in respect of labour use and capital investment. We stress, however, that any development in this direction must not prejudice supplies to the more lucrative liquid milk market during the winter months: the present level of winter milk must be sustained, and this will continue to involve the major proportion of the dairy herd, but additional production should increasingly be based on a low-cost system such as would obtain with seasonal dairying.

41 Against this background, we have suggested an expansion totalling 300,000 dairy cows over the next five years. The majority of these cows should be spring calvers, whether in spring calving herds or not. By 1972/3 total milk output should show an increase of over 10 per cent, which would be enough to provide for the extra demand for milk and milk products. These extra dairy cows would produce about 170,000 calves a year suitable for fattening for beef. Moreover, given a profitable and stable beef market, calf slaughterings should fall to a lower level and the existing dairy herd might yield say 140,000 additional calves for beef, though at the risk that a proportion of them would not qualify for guarantees under present grading standards.

42 The total additional capital cost of the expansion of 300,000 dairy cows, including the cost of housing their progeny intended for fattening, would be about £46½m. Additional variable costs, with all concentrated feed assessed at bought-in prices, would total about £28m a year, but improved grassland management should result in higher stocking rates, and continued improvements in labour productivity should enable a small reduction to be made in manpower requirements. The net import saving in milk products and beef that would be likely to accrue from an expansion of this magnitude in the dairy herd would be about £34m a year, assuming that the additional cereals and protein required were obtained entirely from higher home output. Deducting this contribution of the arable sector, the net import saving attributable to the livestock sector would be £23m.

43 Expansion of beef production from the beef herd raises technical questions about the efficiency of single suckler production. There is scope for improvement through the use of better bulls and possibly by matching the curve of nutrient requirements of the breeding cow with the curve of pasture growth. But any form of specialised beef production based on the use of suckler calves is not, unfortunately, a very efficient process in terms of land and food use, and of necessity on lowland farms, it must be a complementary adjunct of other more intensive enterprises. Another possibility we have considered is increasing the number of homebred stores by means of the 'bred heifer' system. This system has the attraction of providing a calf with little additional land, as well as providing additional beef more quickly and with less demand on producers' capital resources. Unfortunately insufficient investigation has been undertaken to warrant a firm endorsement of the technique.

44 After studying the range of technical possibilities over the next five years, we have concluded that the highest increase in beef cows that it is prudent to postulate is 60,000 a year. Such an expansion would eventually produce an additional 64,500 tons of beef a year, though the full benefit of the expansion would not be realised until after 1972/3. There would also be the additional 170,000 beef-type calves resulting from the expansion of the dairy herd which, with culled cows, would eventually add 59,000 tons of extra beef. An economic climate which favoured an expansion of beef cow numbers of this order would also lead to a higher calf retention from the dairy herd. As suggested above, this could lead to

the retention of an additional 140,000 calves, equivalent to 35,000 tons of beef, bringing the total of extra beef to 158,000 tons. This makes no allowance for any greater intensity of production from the beef herd which should, over the five year period, more than counterbalance the loss of veal from the 140,000 calves.

45 The resources that would be required for such an expansion of the beef herd are difficult to assess because of the many different systems of fattening that are in use. But we have calculated that capital costs could amount to about £35m in total and variable costs to £24m a year. There would also be need for greater efficiency in the use of grassland and for increased feeding of arable by-products, eg straw and pea haulm silage. The labour force, if maintained at its present size on livestock farms, should be capable of handling the larger herd.

46 The net import saving after 1972/3 resulting from the expansion of the beef herd and the associated higher retention of dairy bred calves from the existing herd has been assessed at £19m, whilst the additional beef from the expanded dairy herd (already included in paragraph 42) would bring the total to £32m a year. These figures assume that the additional cereals and protein would be home grown, the credit for which falls to the arable sector. Deducting this feed, the net contribution to import saving attributable to the livestock sector from the additional beef is £12m from expansion of the beef herd and higher retentions from the existing dairy herd, and £9m from expansion of the dairy herd, a total of £21m. The net import saving attributable to the livestock sector in respect of both milk products and beef would thus total over £35m.

### *Sheep*

47 Sheep farming, both on the lowlands and in the hills and uplands, has been less involved in the technological revolution that has characterised agriculture as a whole than any other branch of farming except possibly beef production based on the single suckled cow. This is especially apparent on the lowlands where fat lamb production commands such low gross margins that it is becoming a dubious financial proposition except on low rent land. Yet the knowledge and materials exist to increase substantially the level of production and on the higher ground this could be achieved without diversion of land or feed from other branches of livestock production.

1 With imports providing nearly 60 per cent of supplies, there is plenty of scope for import substitution. Expansion of production is, however, limited by physical factors and by the financial resources required. Without a substantial improvement in incentives, we believe the most that could be hoped for on the lowlands would be the maintenance of the existing level of production. In the uplands and hills, we see an increase in sheep numbers as a result of improving rough grazings. By 1972, we believe it should be possible to improve some 1½m acres of rough grazings, to the benefit of both sheep and cattle production. If some 1m of these acres were devoted to sheep, there could be an increase of about 300,000 lambs a year by 1972.

49 We estimate that the cost in extra resources to maintain the existing level of production on the lowlands, but on a reduced acreage, would be about £½m a year. For the hills and uplands a total of some £4m would be required for capital equipment such as fencing and housing. Variable costs would be a further £0.6m a year. The gross import saving from the extra output from the uplands and hills—mutton, lamb, wool and other by-products—would be approximately £1.5m a year. Deducting imported inputs and cereals to be credited to the arable sector would reduce the net import saving contribution attributable to the livestock sector to £1.3m.

### *Pigs*

50 The pig industry traditionally suffers from manifestations of the pig cycle, with periods when pigs are in short supply and the situation aggravated, for the bacon curers in particular, by the diversion of pigs to the fresh meat market because other meats are scarce. The prolificacy of the sow is such that a very rapid rate of expansion is biologically possible—the breeding herd could, for example, be at least doubled in size by 1972/3. We believe, however, that an annual average increase of 70,000 sows is more realistic, given circumstances favourable to a stable expansion.

51 The capital cost of an expansion of this order, covering accommodation for the breeding and fattening herds, has been calculated at just over £60m in total by 1972. Variable costs would amount to nearly £60m a year. The manpower requirement, at present levels of labour productivity, would be of the order of 8,500 additional full-time workers, but productivity improvements over the remainder of the herd during the next five years and the availability of family labour should substantially reduce and perhaps eliminate this requirement. After meeting the projected extra demand for pork, the balance of the resulting pigmeat would be available for bacon, which could result in a net import saving of about £67m. Of this, £36m would more properly be credited to the arable sector, reducing the net import saving contribution attributable to the livestock sector to £31m.

### *Poultry*

52 The poultry industry has made striking improvements in efficiency in recent years, in the production both of eggs and of poultrymeat. We think that further improvement will be made, and that the existing egg laying flock will be sufficient to meet the growth in demand by 1972/3, though this growth will be only about 4 per cent and largely confined to meeting the needs of a larger population. There is no scope for further expansion of the egg laying flock. Improvement in food conversion should enable the additional output to be obtained without any increase in feed, and improvements in labour productivity may be expected to continue. We believe it should be possible to eliminate present imports of £2-£3m a year by a small change in the seasonal pattern of output, with a marked saving in manpower and without incurring any significant additional costs.

53 Similarly, there is no technical barrier to meeting the whole of the demand for poultrymeat from increased home production. Demand is increasing rapidly, and should be about one-third higher by 1972/3. Further improvements in broiler chicken production are expected and intensive methods are likely to be increasingly adopted for turkeys, the output of which is likely to rise in line with that of broiler chickens. We estimate that output of broiler chickens will rise from 300,000 tons in 1966/7 to at least 450,000 tons in 1972/3, while production of turkey meat should rise from under 40,000 tons to at least 60,000 tons over the same period. With additional meat from culled hens and a small contribution from ducks and geese, the total market should reach 600,000 tons, or more, by 1972/3.

54 The expected improvements in efficiency will enable the additional production to be obtained with a much smaller capital cost than at present levels of efficiency. We were told that an expansion of 100m broiler chickens, roughly equivalent to the expansion of 150,000 tons of broilermeat postulated above, would cost £5½m, excluding processing factories, while the capital cost of the additional turkey meat, if obtained from 5 large units, would cost about £3½m.

Thus the total capital cost would be £9m. Additional variable costs would amount to £21½m a year, and a maximum of 1300 additional workers would be required in poultry production units. To measure import saving on the basis of the cost of the very small quantity of poultrymeat already imported is not wholly realistic, but for want of a better measure we have taken average import values for eggs and poultrymeat in 1967. On this basis, the gross import saving by 1972/3 would be about £45m a year; assuming the maximum use were made of home produced cereals, the net import saving would be about £36½m, of which the contribution attributable to the livestock sector would be £28½m.

#### *Glasshouse foodcrops*

55 In this sector the home industry's efficiency and competitive position has improved considerably in recent years. We believe the industry to be technically capable of producing an additional 50,000 tons of tomatoes and so displacing a major part of the tomato imports during April-September, plus at least £½m of winter lettuce. The capital cost of modernising 1,000 acres of existing glasshouses and building 500 acres of new glass would be just under £25m, and after allowing for imported inputs, particularly oil, net import saving would be about £9m a year. Whilst we believe this additional output could be produced competitively with Holland, the main foreign supplier during the times of year in question, it would be unrealistic to assume that a corresponding volume of imported tomatoes would be diverted elsewhere by 1972/3 unless further restrictions were placed on access to the British market. We believe that a more realistic aim would be to displace some 15,000 tons of Dutch tomatoes by 1972/3, leaving the displacement of 50,000 tons as an ultimate objective. Most of the additional output of 15,000 tons would be obtained from a continuation of the present rate of replacement of existing glass, so that only about 120 acres of additional glass would be required at a capital cost of about £3m. About 300 additional men would be required for the extra acreage; other variable costs would amount to some £800,000 a year. The net import saving would be about £2½-£3m a year. The obstacles to this expansion, apart from long-term confidence in the investment, are planning procedures and taxation difficulties. These taxation difficulties, which could have the effect of fragmenting the industry, are particularly acute among horticulturists.

#### *Field vegetables and soft fruit*

56 In the category of field vegetables, we see considerable scope for an expansion in the production of dry bulb onions, with provision for artificial drying, and some scope for additional production of cauliflower and broccoli and certain types of carrots. There need be no additional acreage of carrots; import replacement should come mainly from improvements in production and storage. Among the soft fruit imports, strawberries are by far the largest item both in terms of fresh and of temporarily preserved fruit. Production of strawberries could, with advantage, be encouraged, an important factor inhibiting expansion being the depressing effect of out of season imports on prices during May and early June. An expansion of these field vegetables and soft fruits of the order we have postulated would require roughly an additional 10,000 acres of land, an annual variable cost of £½m and a total capital expenditure in drying and storage possibly in the region of £1-1½m. This should enable a net import saving of £2-3m a year to be made.

#### *Top fruit*

57 Among the top fruits, apples provide the main opportunity to save imports,



but additional quantities of pears could be grown, some of which could replace imports. Small savings could be made by expanding output of cherries and plums. New plantings of dessert apples in recent years should raise output to at least 300,000 tons by 1972/3, but imports are not likely to be reduced significantly so long as present import regulations remain unchanged. But this apart, there is little possibility of cutting back further into the top fruit imports in the period under review since trees planted now will not come into full production until after 1972/3. Although growers are unlikely to increase output further unless given assurances that dessert apple imports will be correspondingly reduced we have, nevertheless, attempted to assess the resource costs that would be incurred over the next five years to produce the degree of expansion in production that we consider technically possible. To yield an additional 50,000 tons of dessert apples, together with 25,000 tons of pears, a similar quantity of culinary apples and small quantities of other top fruits, there would be need of an extra 17,000 acres of land, an annual variable cost of £1.1½m and a total capital cost to cover planting and storage of £11¼m.

#### *Other horticultural produce*

58 This category includes flowers, bulbs and nursery stock and mushrooms. These products have in common the fact that output has expanded well in recent years to capture the major share of a growing market. We expect this favourable situation to last over the next five years, with the home grower meeting all the increased demand—which we estimate at about £5m a year by 1972/3—thereby saving a corresponding potential import. As most of the expansion in output would come from increased yields, the additional capital and variable costs would be small.

### **Implications of commodity proposals**

#### *Capital and variable costs*

59 In the preceding commodity summaries, each of the products has been taken in isolation for purposes of assessing the capital and variable costs of the expansion envisaged. This method is acceptable when considering particular products, but it is inadequate for purposes of considering the expansion programme as a whole. In the first place, it makes no allowance for the cost of fertilisers, drainage and lime (estimated at £21m a year) that an expansion of the arable acreage would involve for the livestock sector in maintaining the existing numbers of ruminant livestock on a reduced acreage of grass. Nor does it allow for the allocation between the various arable products of the extra cost of drainage and lime incurred within the arable sector. Secondly, for each of the livestock products, it necessitates calculating the additional concentrate feed as though it would all be bought in at farm-gate prices.

60 In Table 3 we have combined the separate product costs (and the separate import saving contributions) into an integrated programme. This method of assessment, which gives a more realistic national picture of the expansion as a whole, recognises that the bulk of the additional feed grown would be consumed by the additional livestock. Instead of using notional farm-gate prices for feed, the capital and variable costs required to produce the additional feed have been taken into the livestock costs. Similarly, the £21m required to raise stocking rates to accommodate the existing grazing livestock has been allocated to particular products. In this way, the whole of the capital and variable costs are charged to the products to which they would contribute.

Table 3 Cost of resources by sector, and import savings/£ million

<i>Livestock (including feed) (d)</i>	<i>Fixed capital 1967-72(a)</i>			<i>Annual physical inputs (a)</i>		<i>Import saving</i>	
	<i>Livestock</i>	<i>Arable(b)</i>	<i>Total</i>	<i>Livestock</i>	<i>Arable(b)</i>	<i>Gross</i>	<i>Net(c)</i>
Dairy cows	40.0	13.0	53.0	12.3	9.0	21.3	21.4
Beef from expanded dairy herd	6.5	4.3	10.8	3.2	3.1	6.3	12.6(e)
Beef cows and fattening cattle	26.5	11.9	38.4	12.6	7.6	20.2	12.0(e)
Additional beef from existing dairy herd	8.5	3.9	12.4	3.2	2.7	5.9	7.2
Pigs	60.5	15.6	76.1	18.6	12.3	30.9	66.7
Poultry, layers (f)	—	—	—	—	—	—	—
Broiler chickens and turkeys (f)	9.0	3.7	12.7	12.5	2.6	15.1	5.0
Sheep	4.0	—	4.0	0.5	0.6	1.1	31.5
<b>Total</b>	<b>155.0</b>	<b>52.4</b>	<b>207.4</b>	<b>62.9</b>	<b>37.9</b>	<b>100.8</b>	<b>157.8</b>
<i>Rent of arable</i>							
Cereals (excluding part for livestock expansion)	—	11.0	11.0	—	7.5	7.5	26
Sugar beet	—	—	—(g)	—	1.5	1.5	7(e)
Peas and beans (for human consumption)	—	0.3	0.3	—	0.5	0.5	7
Rapeseed	—	—	—	—	0.5	0.5	2
Herbage and brassica seed	—	—	—	—	0.2	0.2	1
Other costs not allocated to products (h)	—	4.6	4.6	—	2.9	2.9	—
Less saving on potatoes	—	—	—	—	-3.7	-3.7	-0.5
<b>Total</b>	<b>—</b>	<b>15.9</b>	<b>15.9</b>	<b>—</b>	<b>9.4</b>	<b>9.4</b>	<b>3</b>
<i>Horticulture—Total (f)</i>	—	—	9	—	—	—	45.5
<b>GRAND TOTAL</b>	<b>155</b>	<b>68</b>	<b>223</b>	<b>63</b>	<b>47</b>	<b>112</b>	<b>218 (e)</b>

(a) Some of the fixed capital for fattening cattle will not be required until after 1972. The annual physical inputs represent the increase in inputs since 1967-68 when expansion commenced

(g) Net import saving equals gross import saving, less imported inputs at constant 1952 prices.

(40) Net import saving equals gross import saving, less imported inputs as a result of arable expansion

(d) Resource costs of additional food and their import content allocated to livestock, assuming a constant import saving, are imported inputs, at average 1967 or post-devaluation prices

(6) Part of the import saving from additional beef, and the import savings from additional

(19) 1965/7 base year

(a) Excludes capital cost of sugar beet factory (£11m) after 1973/74

*Acreage*

61 Table 4 shows the changes in use of agricultural land that would follow from the adoption of the changes in production that we envisage. Two aspects have been of particular concern to us—whether there is sufficient land suitable for arable production to extend the arable acreage by 1.7m acres, and whether it is practicable to expect an increased ruminant livestock population to be carried on a grassland acreage reduced by 1.7m acres.

**Table 4** Proposed changes in acreage/million acres as at June

	1967	1972	Change
Wheat	2.31	3.30	+ 0.99
Barley	6.03	6.50	+ 0.47
Oats	1.01	1.20	+ 0.19
Mixed corn and rye	0.10	0.10	—
<b>Total cereals</b>	<b>9.45</b>	<b>11.10</b>	<b>+ 1.65</b>
Potatoes	0.71	0.64	— 0.07
Sugar beet	0.44	0.49(a)	+ 0.05(a)
Peas and beans	0.18	0.22	+ 0.04
Beans for stockfeed	0.14	0.40	+ 0.26
Oilseed rape	0.02	0.06	+ 0.04
Foddercrops	0.65	0.40	— 0.25
Fruit	0.23	0.25	+ 0.02
Other vegetables	0.23	0.22	+ 0.01
All other crops	0.08	0.08	—
Bare fallow	0.23	0.18	— 0.05
<b>Total tillage</b>	<b>12.35</b>	<b>14.05</b>	<b>+ 1.70</b>
Grassland	18.30	16.60	— 1.70
<b>Total crops and grass</b>	<b>30.65</b>	<b>30.65(b)</b>	<b>—</b>

(a) After 1974

(b) Assumes that the acreage of rough grazings improved into crops and grass will offset the loss of agricultural land to urban development and forestry

62 On the first question we are in no doubt. A tillage acreage of 14m acres is less than the peak acreage reached during the war (1943 and 1944), since when there have been considerable advances in cereal varieties suitable for wetter climates and in methods of cultivation. We envisage wheat taking over from barley in areas adjacent to East Anglia and the barley acreage extending further north and west. In the traditional cereal growing areas there would be an extension of the acreage down to arable break crops but the cereals acreage

itself would be unlikely to increase.

63 On the grassland acreage, a loss of 1.7m acres to arable production and an increase in cattle and sheep to the extent we have postulated would require an increase in stocking rates of all grazing livestock of the order of  $3\frac{1}{2}$  per cent a year over the five years to 1972/3. As all the additional stock would not then be fully grown, there would be need for a continuing improvement of the same order thereafter. Although this is a faster rate of improvement than has been sustained in the past, we have no doubt that an increase in stocking rate of this magnitude is technically possible: the question is whether it is likely that modern techniques of grassland management would be applied soon enough to bring it about. Our conclusion is that, given the pressure of numbers on the reduced grassland acreage and the clear indications in recent years that farmers are becoming alive to the potentialities of their grassland, an adequate improvement in stocking rate would be forthcoming.

#### *Manpower*

64 We deal with the manpower situation in agriculture in some detail later in our report. We think it sufficient to note here that a simple extrapolation of trends suggests a probable rate of outflow of 20,000–25,000 man-equivalents a year up to 1972, while a more sophisticated approach, based on forecast rates of regional unemployment which assume a high rate of activity in the economy as a whole, gives a predicted rate of outflow of 30,000 a year over the five-year period.

65 When taken in conjunction with the expansion in production that we have postulated, these rates of outflow give labour productivity increases of  $7\frac{1}{2}$ – $8\frac{1}{2}$ , and  $9\frac{1}{2}$  per cent a year to 1972, as compared with a rate of about 6 per cent a year achieved from the mid-1950s to the mid-1960s. We recognise that regional rates of unemployment may differ from the forecasts used and that changes in other factors—notably the amount of capital injected and the ratio of agricultural wages to industrial wages—may affect the outcome. We also accept that labour productivity is likely to rise faster during a period of greater expansion. But the present predictions of labour outflow cause us concern and we conclude that there could well be insufficient labour in certain areas and that adjustments would have to be made to meet in full the projected expansion in production.

#### *Import saving*

66 Throughout our study of the scope for expanding food production we have kept in mind the projected changes in demand for food by 1972/3. The demand assessments were made on the basis of constant 1966 price relationships, with a population increase of 3.45 per cent between mid-1966 and mid-1972 and a rise of 9.8 per cent in real personal disposable income a head over the period. The total increase in demand for food by 1972 over 1966 was about 6 per cent, but within this total figure there were marked variations between products. Demand has, however, proved to be a limiting factor to expansion in only three of the major products—potatoes, poultrymeat and eggs. For the rest, there are imported supplies that could be displaced, though we should point out that, under present arrangements in the British market, additional home-produced food does not automatically displace an equivalent amount of imported food. The marketing problem would probably be greatest with bacon because of the premium that certain imported bacon enjoys over the domestic product: there could also be increased difficulty in marketing fat cattle at the peak period of the year. Generally, there is need for a better relationship between producers and processors: if import saving is to be maximised, it is essential that there should be

the closest collaboration between them so that each appreciates the requirements of the other and anticipates problems before they develop.

67 The total import saving of £218m a year at 1967/8 prices (Table 3) that we calculate our proposals could achieve should be seen against this background. It should also be noted, as we illustrate later in our report, that import saving is not synonymous with improvement in the balance of payments, though we believe there to be a strong correlation between them.

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## **Manpower trends in agriculture**

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### *Introduction*

68 We have already reported\* on the trends in the agricultural labour force in relation to the 1970 objectives of the National Plan. The present report is concerned with the manpower situation in the industry in 1972/3 against the background of our proposals for expansion. It is based on the findings of our manpower working group, who provided us with a number of projections reflecting existing trends and commissioned a further study from Dr K. Cowling and Mr D. Metcalf, on whose work our first report was partly based.

### *Projections to 1972*

69 Our projections of the outflow of labour from agriculture between 1967 and 1972 carried forward trends in the overall numbers in the labour force since 1960. The first projection was based on the assumption that the outflow from agriculture (of whole- and part-time workers and farmers and their wives in the United Kingdom) followed a linear trend; extrapolation of this trend gave an outflow of 130,000 man-equivalents between 1967 and 1972. A second assumption was that the outflow from agriculture remained a constant proportion of the labour force, and thus declined year by year in actual numbers, and gave an outflow of 100,000 man-equivalents for the period. A third alternative was to assume some degree of acceleration in the outflow to give a loss of 150,000 man-equivalents. The actual average rate of outflow in terms of man-equivalents was about 21,000 a year over the decade from 1957/8 to 1967/8, and the unadjusted projections of trend suggest that the most probable rate of outflow up to 1972 would be in the range of 20,000–25,000 a year. In all three assumptions we took the view that the number of farmers leaving the industry would not rise rapidly during the period with which we were concerned.

70 A more sophisticated approach was taken in the projections presented by Cowling and Metcalf. They had studied, on a regional basis, the relationship during 1960–64 between the outflow of labour from agriculture (in terms of regular whole-time workers plus unemployed agricultural workers in Great Britain) and factors such as the level of unemployment, the ratio of agricultural wages to industrial wages, and changes in technology. The relationships established in this study were used for projecting the outflow of workers from agriculture for each year up to 1970, and were adopted as the basis for our first report. This study revealed the crucial importance of changes in the level of total unemployment in a region in determining the size of labour outflow from agriculture and in a new projection based on this study the historically more static influences, such as the relativities of agricultural and industrial wages and agricultural wages and product prices, were ignored. If these relationships remain

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\* *Manpower in the industry* October 1967, NEDO

substantially the same as in the recent past, their omission is unlikely to be important (see paragraph 77). The original study was up-dated by the inclusion of data for 1965 and 1966 for the purpose of the new projections, and a fresh appraisal was made of the likely levels of regional unemployment, in the light of devaluation and the Government's regional policies, in the year to 1972. The estimates (seasonally adjusted) of national unemployment ranged from 2.1 per cent in the first quarter of 1968 to 1.5 per cent in the first two quarters of 1969. After some fluctuation in the next four quarters the estimates were stabilised at 1.8 per cent from the third quarter of 1970 onwards. These national estimates were converted into appropriate rates for individual regions. As in the earlier projections to 1970, regions were grouped into 'high activity' and 'low activity' regions.\* On this basis, a total outflow was projected of 130,000 regular whole-time workers in Great Britain (say 135,000 for the United Kingdom) between June 1967 and June 1972.

71 As well as making the above projections, Cowling and Metcalf also carried out a separate study, going back as far as 1950, to try to obtain a better picture of the differences from region to region in the association between the outflow of regular whole-time workers from agriculture and general unemployment in the region. Two relationships were investigated, the first between the outflow of workers from agriculture and the proportion unemployed in the region, and the second between the outflow of workers from agriculture and the percentage change in the proportion unemployed in the region. The latter relationship, calculated as an average worked for the period as a whole, was found to fit the annual figures better than the former. Both relationships were used to make projections of the outflow from 1967-72; the difference between them was comparatively small. The first relationship—between outflow and proportion of unemployment—forecast an outflow of 105,000 whole-time workers in the five year period, and the second relationship—between outflow and changes in the proportion of unemployment—forecast an outflow of 100,000.

72 We considered these projections arising from the new relationships calculated by Cowling and Metcalf, but for statistical reasons we preferred the projection outlined in paragraph 70 above, which forecast an outflow of 130,000 regular whole-time workers in Great Britain. This was approximately equivalent to the highest of the projections referred to in paragraph 69, after taking account of farmers and their wives, part-time workers and workers in Northern Ireland. In preferring the method giving the highest prediction we realised that if national unemployment proved to be higher than was assumed for purposes of the projection, then the outflow from agriculture would be lower than predicted (and *vice-versa*). We recognise the hazards in attempting to forecast the course of unemployment. The annual pattern of outflow, based on the rates of unemployment assumed, is set out in Table 5. It includes a forecast outflow for 1966 of 15,000 whole-time workers, which turned out to be substantially accurate in relation to the known outflow of 16,200. The highest rate of outflow of whole-time workers is predicted between 1968 and 1969, nearly 28,900, and after a drop to 23,400 in the following year, comparative stability is predicted for the last two years of the period at 27,400 a year.

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\* 'High activity' regions are Department of Employment and Productivity regions of low unemployment—London and the South-East, Eastern and Southern, Midlands and Yorkshire and Lincolnshire.

'Low activity' regions are the South West, North West, North, Scotland and Wales.

Table 5 Regional pattern of projected outflow of whole-time workers from agriculture, June 1966-June 1972

Department of Employment and Productivity region.	Employment and unemployment 1966	Outflow				Employment and unemployment		Percentage fall 1966-72
		1966- 1967	1967- 1968	1968- 1969	1969- 1970	1970- 1971	1971- 1972	
London and S.E.	46433	2425	3822	4851	3841	4339	4413	23691
Eastern and Southern	71045	2684	4860	5406	4690	5382	5485	28507
South Western	38271	1761	2863	3315	2805	3304	3394	17413
Midland	44351	1703	3090	3250	2808	3231	3303	17385
Yorks. and Lincs.	40133	1577	2515	2886	2487	2883	2937	15285
North Western	17013	876	1173	1452	1228	1389	1491	7609
Northern	22961	1056	174	1869	1528	1873	1936	8436
Scotland	49384	2193	2992	3958	2946	3716	3841	19647
Wales	18290	670	1803	1863	1032	1315	618	7301
<b>Total GB</b>	<b>347881</b>	<b>14946</b>	<b>23292</b>	<b>28850</b>	<b>23365</b>	<b>27432</b>	<b>27419</b>	<b>145304</b>
Northern Ireland (a)	16500	1000	1000	1000	1000	1000	1000	6000
<b>Total UK (a)</b>	<b>364400</b>	<b>15900</b>	<b>24300</b>	<b>29900</b>	<b>24400</b>	<b>28400</b>	<b>28400</b>	<b>151300</b>

(a) Estimated

Note: The fall of 41.5 per cent between 1966 and 1972 is equivalent to an annual rate of 6.0 per cent compound

### *Regional pattern of outflow*

73 The Cowling/Metcalf projections also provide forecasts of the regional pattern of the total outflow of 130,000 whole-time workers between 1967 and 1972. These are also included in Table 5. For convenience, the regional estimates of outflow have been related to the regional distribution of whole-time agricultural workers (including unemployed) for Department of Employment and Productivity regions in 1966—so that the total outflow predicted for the six years is 145,000 for Great Britain and say 151,000 for the United Kingdom as a whole. (This corresponds to an outflow of 130,000 for the five-year period 1967–72 in Great Britain).

74 For the country as a whole the projections imply a fall of 42 per cent in whole-time workers between 1966 and 1972. The highest rate of outflow would be in London and the South East, with an outflow of 51 per cent. Other regions with above-average rates of outflow are the South Western (46 per cent) and North Western (45 per cent), while the Eastern and Southern regions, Scotland, Wales and the Midland region would be only slightly below the average. The Northern region would have the lowest rate of outflow, 37 per cent. An assumption has been made that the fall in Northern Ireland would be at the rate of 1,000 a year, or 36 per cent over the six-year period.

### *Labour productivity implications*

75 Very substantial improvements in manpower productivity would be required by 1972/3 if our proposals for higher output were to be realised with a reduction in the labour force of this magnitude. The increase in net output envisaged is equivalent to an annual rate of about 4 per cent compound between 1967/8 and 1972/3. With a predicted outflow, in terms of man-equivalents, of about 5 per cent a year on average over the period the necessary increase in labour productivity would have to be sustained at an average rate exceeding 9 per cent. This would be even higher than the particularly high rate of improvement in 1967/8, when net output rose sharply after two years of slight decline. Over longer periods lower rates of improvement have been experienced in the past; for example, an average annual improvement of 6½ per cent compound was achieved over the period 1960/1 to 1967/8. A slightly faster rate of labour productivity improvement—about 7½ per cent—would be necessary even if labour outflow was as low as 100,000 in total. Within the range of possibilities being considered, a difference in outflow of 10,000 workers over the period would involve an adjustment of about ½ per cent in labour productivity if the same total output was to be realised.

76 In addition to the contribution of the workers themselves there are many other factors which have a bearing on productivity. This can be raised by higher yields of crops and livestock, the greater use of machinery and the better equipment of buildings, the wider availability of skilled contractors' services, more technical advice, improved managerial skills, and a more rapid rise in output. We would also draw attention to the necessity of considering more than the mere numbers in the labour force in relation to productivity. The quality of the available manpower is a vital consideration in obtaining the necessary improvement in productivity, using the word quality to mean the level of skill, the ability to adapt to new situations, and the right balance of ages and skills. To make the best use of the available manpower it is essential that there should be adequate facilities for training and retraining, both for new entrants and for the existing labour force.



### *General*

77 The first Cowling/Metcalf projections contained an assessment of the effect of changes in the ratio of agricultural wage earnings relative to industrial wage earnings. If, for example, in the high activity regions (see footnote to page 22) the ratio of agricultural wage earnings relative to industrial wage earnings increased from the current level (70 per cent) to 80 per cent, the rate of outflow of whole-time workers from agriculture would fall by nearly 3 per cent. Thus the outflow indicated in Table 5 (6 per cent a year compound) would be roughly halved. In the low activity regions such an improvement in agricultural wages would result in a fall of about 2 per cent in the outflow *ie* of about one-third.

78 In our published report on manpower in the industry we expressed disquiet about the manpower situation. Our subsequent work has not revealed any major factor which causes us to reconsider our original opinion; although changes in economic circumstances marked by devaluation and the 1968 Budget make projections of unemployment in the next two or three years very uncertain, we have postulated lower rates of unemployment and hence higher rates of outflow from agriculture than in our first report. If the level of unemployment turned out to be higher than our estimates—a situation which is possible if the balance of payments position does not respond as well as expected to devaluation—then we could expect a reduced outflow of labour from agriculture. Assuming unemployment were 0.5 per cent higher in all regions (eg 1.6 per cent instead of 1.1 per cent in the Eastern and Southern region in 1968/9) then the outflow over the period 1968–72 for Great Britain would be reduced from 130,000 to about 110,000 whole-time workers.

79 We recognise that in presenting projections of manpower in 1972/3 for the industry as a whole we have not related the needs of individual sectors of the industry to the supply of appropriately trained manpower, distributed throughout the country in the necessary way. This has not been possible in view of the limitations of available statistics based on the standard-man-day concept. Such evidence as was put before us tended to indicate that the sectors where most difficulty was likely to be experienced would be dairy production and horticulture; the sectors least affected would be arable crops and sheep, while beef, poultry and pigs were likely to fall between the two. These points need to be born in mind when considering the views of the various groups, in particular the view of the arable group that because of the rapid pace of mechanisation the outflow of labour could increase in the eastern counties but that in the mixed arable and livestock areas there might have to be a slowing down in the rate of outflow; and the view of the livestock group that there could not be a reduction in the beef, pigmeat and poultry sectors if the proposals for these sectors were to be realised.

80 As we have noted in paragraph 65, our general conclusion is that labour outflow at the rates forecast is a matter for concern. There could well be insufficient labour in certain areas and adjustments to the rate of outflow would have to be made to meet in full the projected expansion in production.

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### **General economic aspects**

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81 We conclude our report with an examination of certain points of a general economic nature which form a background to our study.

#### *Use of resources*

82 The first of these is the relative efficiency in the use of resources, which

conventionally are grouped into land, labour and capital. Land is a vital resource to agriculture and, whilst claims on the total stock of agricultural land will no doubt continue, the amounts likely to be lost by 1972 are not likely to be such as to justify taking them into account. Our proposals for expansion imply a significant further increase in the intensity of land use.

83 As for manpower, there is no doubt that labour productivity in agriculture has increased rapidly in recent years: as we have already noted, net output per worker in agriculture over the past decade has increased at an average compound rate of 6.0 per cent a year. This figure takes account of all who are engaged in agriculture, including farmers and their wives. Our manpower calculations suggest that, when related to the expansion proposals, even the lowest of a range of assumptions about the rate of outflow of manpower from the industry implies a higher rate of improvement of labour productivity than in the previous decade. Past experience has shown that labour productivity increases rapidly when output is rising rapidly, so that the proposals we have made for a faster rise in net output should contribute to the achievement of a faster rate of labour productivity improvement. In passing, we think it worth noting that labour productivity in agriculture has improved much faster than in the economy as a whole; the National Plan showed that, from 1960-64, output per head in agriculture rose by about 6 per cent a year, which was more than twice as fast as in the economy as a whole.

84 The use of capital by agriculture is inextricably linked with the manpower situation in the industry. If, despite a policy of expansion, the outflow of workers and farmers from the industry continues, as is predicted, there will have to be a continuation of the offsetting increase in the amount of capital invested in the industry, with further intensification to make expansion possible. An attempt is made by the Ministry of Agriculture, Fisheries and Food to measure for agriculture the overall changes in the efficiency of use of all resources; data in continuation of that published in *Economic Trends* (May 1961) show that, over the period 1954/5-1965/6 overall productivity in the industry was rising on average by almost 2 per cent a year. We know of no corresponding data for other sectors of the economy, but the above calculations serve to demonstrate agriculture's increasing efficiency in the total use of resources.

#### *Availability of resources*

85 Secondly, we should like to comment on the mobility of labour and capital between agriculture and other industries—the transfer of land is not a major consideration in this context. The continuing outflow of labour from agriculture suggests that many agricultural workers have been willing and able to find alternative employment, but there is little evidence about the occupations to which they transfer. It has been argued that many of the workers leaving agriculture do not find employment directly in export industries or other import saving industries, though equally it can be argued that, directly or indirectly, they increase the pool of labour available for such industries. The practical question is whether it would be necessary for the outflow of labour with the appropriate skills to slow down to ensure achievement of the expansion in output that has been postulated and as we have already indicated in paragraph 65, we consider that such a slowing down could well be necessary, at least in certain areas. The point we wish to make here is that this labour would be making a direct contribution to import saving in agriculture, whereas it is impossible to say whether it would make a comparable direct contribution to import saving elsewhere. Moreover, even with a somewhat lower rate of outflow, labour productivity in

agriculture would still rise at a rate substantially higher than in industry generally.

86 Of the resources used by agriculture, capital is the one which makes the most direct and real charge on the rest of the economy. Agriculture's borrowings from banks and specialised agencies, and credit taken from merchants, are financial resources which might have been used in other sectors of the economy. But these sources have not hitherto provided the whole of agriculture's capital needs; because of the industry's structure, with its preponderance of small unincorporated businesses, a considerable part of its new capital must be obtained from cash flow, with only a minimal contribution from private funds from outside the industry through the stock market.

#### *Balance of payments*

87 It is generally recognised that frequent balance of payments crises have forced governments to apply measures which have slowed down the growth of the economy. Agricultural expansion alone cannot of course solve this problem, a remedy for which must be sought elsewhere. But insofar as agricultural expansion can make a net contribution to the balance of payments, it provides additional room for manoeuvre in the framing of general economic policies and would therefore make it easier to pursue an expansionist policy.

88 Our calculations have necessarily been confined to assessing the gross and net import saving consequences of the proposals for expansion, after taking account of any additional imports that such an expansion would call for. But the import saving is not synonymous with the contribution which the increased output may make to the balance of payments. The latter depends not only on the volume of imports replaced, but on any changes in the terms of trade which policy might produce and on the extent to which reduced imports lead, via a cut in the incomes of foreign countries, to a reciprocal fall in British exports compared with the level they might otherwise attain. Generally speaking the 'terms of trade effect' of agricultural expansion is likely to be favourable, but it may be partly offset or even exceeded by the 'reciprocal effect'. The net result cannot be predicted, but it is likely that the reciprocal effect would be greater for a country whose imports from Britain account for a high proportion of its total imports or which is in a weak balance of payments position.

89 We have not been able to explore these complicated matters in detail or to assess their quantitative significance. Such work as has been done on this question, however, indicates that agricultural expansion does make a positive contribution to the balance of payments, although not necessarily to the full extent of import saving. It is clear that more research is badly needed on the net contribution made by agriculture and by other industries to the balance of payments, either in the form of import saving or by export earnings. A more effective appraisal of these problems will not be obtained until this research is carried out.

90 The United Kingdom has had a substantial balance of payments deficit for a number of years. Imports of temperate zone agricultural products in this period have averaged just under £1,000m a year. Against this background, and whilst appreciating the difficulties of assessing the quantitative significance, we consider that if the agricultural expansion envisaged could, in fact, contribute to a net import saving of over £200m a year, this would represent a major contribution to strengthening the national economy.

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## Implementation

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91 Implementation of our proposals will require appropriate incentives that will provide the means for farmers to expand their enterprises. These incentives will have to be related to the pace of expansion envisaged for the different sectors of the industry and must take particular account of the need for additional capital expenditure and for a possible slowing down of the outflow of manpower from the industry.

92 The broad effect of our proposals is to carry forward beyond 1970 the objectives of the Government's selective expansion programme for agriculture, but at a somewhat faster rate. There are, however, certain differences in emphasis which, in part, reflect restraints that were placed upon the selective expansion programme because of our international commitments. We lay heavy stress on the expansion of arable production and, among the livestock products, we see scope for a larger expansion in pigmeat and beef than was envisaged in the selective expansion programme. These are matters to be taken into account in determining incentive levels.

93 Implicit throughout our proposals is the need for sustained confidence among farmers and growers. This raises the vital question of market stability, which concerns all products including those for which there are guaranteed prices. The collapse of market prices, such as has been experienced in recent years with fat cattle, is a major obstacle to expansion. Market stability is no less vital to horticulturists; their confidence would be strengthened if there were adequate regulation of imported produce to prevent cheap supplies, frequently the seasonal surpluses of other countries, from depressing market prices. Both farmers and growers are, moreover, becoming increasingly dependent on market stability because of their increasing specialisation; reliance on fewer products accentuates the consequences if those products fail to find a remunerative outlet.

94 If our programme is to be achieved, farms and growers will have to be convinced that the considerable effort required of them throughout the period of expansion, and the capital investment that will be called for, will not be undermined by badly phased imports and other factors that create market instability. Given the necessary measures to sustain confidence, we believe that the programme we have drawn up is well within the capacity of British agriculture.

***Part 2 Review of individual products  
and findings by the arable, livestock,  
and horticulture working groups***

# I The arable sector

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## Cereals

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### Introduction

95 Cereals are the United Kingdom's biggest tillage crop, both in terms of acreage and of value of output. They have expanded rapidly in recent years. This expansion has occurred both in acreage and, above all, in yield per acre, and has made a major contribution to the large increase in the net output of British agriculture during the last decade, mainly by enabling a rapid growth to take place in the livestock sector without requiring an increase in the import of animal feedingstuffs. This technological achievement, which reflects great credit on farmers and scientists alike, has not yet run its course, despite the difficulties experienced in the past year or two. The arable group believes that the cereals sector, given encouragement, can make a very significant further contribution to import saving.

### *Relative importance*

96 Ten years ago, United Kingdom cereal production amounted to 8.3 million tons annually, valued at £230m: in 1967/8 it exceeded 14.5 million tons, worth over £350m. About two-thirds of this total is sold off the farm and in 1967/8 realised nearly £240m. This represented over 62 per cent of the total value of crop sales and 12 per cent of the value of total sales off farms.

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**Table 6 Value of sales of farm crops off farms in the United Kingdom/£ million**  
—annual averages

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	1956/7-58/9	1961/2-63/4	1964/5-66/7	1967/8*
Total cereals	134.2	179.3	217.5	239.5
Total farm crops	259.1	307.3	358.2	384.0
Cereals as per cent of total farm crops	51.8	58.3	60.7	62.4

\* Provisional

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97 Cereals now account for 30 per cent of the total acreage of crops and grass, having risen from 7.5 million acres ten years ago to 9.4 million acres in 1967/8. This increase in acreage of 25 per cent over the period has been accompanied by a 73 per cent increase in production, the difference being attributable to the significant advances in yields of the individual crops as well as to a switch in the balance between them. The expansion of the cereals acreage has been ultimately at the expense of permanent grassland; temporary grassland has fluctuated only slightly over the ten-year period.

**Table 7 Cereals acreage and production in the United Kingdom/annual averages**

	1956/7-58/9	1961/2-63/4	1964/5-66/7	1967/8*
<i>Acreage (million acres)</i>				
Total cereals	7.5	7.8	9.0	9.4
Total tillage	11.3	11.0	11.9	12.4
Temporary grass	6.3	7.0	6.6	6.0
Permanent grass	13.5	12.6	12.2	12.3
Production of cereals (million tons)	8.3	10.8	13.1	14.5
Production per acre (cwt)	22.1	27.7	29.1	30.8
* Provisional				

98 The outstanding feature of the growth in cereals production has been the expansion of the barley crop, which in 1964/5-66/7 was more than  $2\frac{1}{2}$  times as large on average as in 1956/7-58/9 and by 1967/8 was about three times as large. As well as displacing permanent grassland, expansion of barley has been at the expense of oats and to a much smaller extent mixed corn. The production of wheat also increased over the period, but at a lower rate.

**Table 8 Production of cereals in the United Kingdom/million tons—annual averages**

	1956/7-58/9	1961/2-63/4	1964/5-66/7	1967/8*
Wheat	2.7	3.2	3.8	3.8
Barley	3.0	5.8	8.0	9.2
Oats	2.3	1.7	1.2	1.3
Others	0.4	0.2	0.1	0.1
Total	8.3	10.9	13.1	14.5
* Provisional				

*Balance of home production and imports*

99 The increase in the home production of cereals not only resulted in a small reduction in the import of cereals and the development of an export trade in recent years but, more importantly, achieved this result during a period of rising demand for cereals, particularly for animal feed. Over the period 1956/7-58/9 to 1964/5-66/7, total supplies of cereals rose from 17.1 to 21.4 million tons and the home producers' share rose from under 50 to over 60 per cent. The provisional figures for 1967/8 indicate a further improvement in the home producers' share of the market. The importance of this improvement in the home producers' share can be judged in relation to the value of imports of cereals and cereal products which, in 1966/7, totalled no less than £224m. The only cereal to be exported in significant quantity is barley, exports of which reached a peak of 1 million tons in 1966/7. The future of this market is however, uncertain.

**Table 9 Total supplies of cereals in the United Kingdom/million tons—annual averages**

	1956/7-58/9	1961/2-63/4	1964/5-66/7	1967/68*
Wheat	7.8	7.6	8.0	7.9
Barley	4.1	6.2	8.3	9.4
Oats	2.4	1.7	1.2	1.4
Maize	2.1	3.7	3.3	3.6
Sorghums	0.3	0.4	0.5	0.3
Others	0.4	0.2	0.1	0.1
<b>Total</b>	<b>17.1</b>	<b>19.8</b>	<b>21.4</b>	<b>22.7</b>
<i>Of which imported:</i>				
Wheat	5.0	4.4	4.3	4.0
Barley	1.2	0.4	0.2	0.2
Oats	0.1	..	..	..
Maize	2.1	3.7	3.3	3.6
Sorghums	0.3	0.4	0.5	0.3
Others	—	—	—	—
<b>Total</b>	<b>9.7</b>	<b>9.0</b>	<b>8.3</b>	<b>8.1</b>
* Provisional			.. Less than 50,000 tons	

#### *The United Kingdom market*

100 Taking the United Kingdom market as a whole, the change in the balance of home production has also led to a marked change over the last ten years in the balance of commodities within the total market. While wheat supplies have remained level at around 8 million tons, barley supplies have more than doubled and in 1966/7 exceeded wheat for the first time. Supplies of maize and sorghums together rose by over a half during the period and now stand at nearly 4 million tons. Oats on the other hand fell by about a half.

101 Of the total supplies of 21.5 million tons in 1966/7, more than a half—11.8 million tons—went for animal feed. Human consumption amounted to 7.4 million tons, or a little over one-third of the total. Rather more than 1 million tons were used for seed and for industrial purposes.

#### *Future demand*

102 Over the period to 1972/3, total demand for cereals is likely to grow further. The demand group confined their projections to non-farm demand, which they postulated, on the basis of unchanged 1966 prices, would show only a small change in total volume, but devaluation could affect the details of this projection. A fall in demand for bread and flour was envisaged which would only partially be offset by a rise in demand for cakes, biscuits and other cereal manufactures. Thus, non-farm demand for wheat would fall by 180,000 tons, but barley was expected to rise by 160,000 tons. (The barley figure took no account of the possible fall in exports from the comparatively high levels of the last three



**Table 10 Cereal supplies and utilisation in the United Kingdom in 1966/7**  
million tons

	<i>Human</i>	<i>Animal feed and waste</i>	<i>Seed</i>	<i>Industrial</i>	<i>Total domestic</i>	<i>Export</i>
Wheat	5.3	2.1	0.2	—	7.6	—
Barley	1.4	5.9	0.4	—	7.7	1.1
Oats	0.1	1.0	0.1	—	1.2	—
Maize	0.6	2.2	—	0.5	3.3	—
Sorghums	—	0.5	—	—	0.5	—
Mixed corn	—	0.1	—	—	0.1	—
<b>Total</b>	<b>7.4</b>	<b>11.8</b>	<b>0.7</b>	<b>0.5</b>	<b>20.4</b>	<b>1.1</b>

years). Demand for maize was expected to expand by 80,000 tons, again before taking demand on the farm into account.

103 Changes in the demand for cereals for animal feed by 1972/3 will be determined mainly by changes in the size and composition of the livestock population, but changes in the pattern of animal nutrition will also influence demand. The expansion in livestock production postulated by the livestock group will call for an increase in the supply of feed grain of about 2½m tons over 1966/7 by 1972/3. The total domestic demand (including ½m tons for export) would thus be in the region of 23½m tons by 1972/3, without allowing for any reduction in demand resulting from increasing efficiency in the use of feed by the existing livestock population.

### **Prospects for expansion**

#### *Wheat*

104 As stated above, wheat is the principal cereal import, costing £113m in 1966/7. Of this total only part could be grown in Britain, the greater proportion consisting of wheat which could not be displaced so long as present bread-making techniques continue. The group has considered the possibilities, not only of directly displacing imports of wheat, but also of displacing imported maize and sorghums by home produced wheat or barley.

105 The British wheat acreage has not changed much since the end of the war, fluctuations mainly reflecting weather conditions at sowing time. The peak acreage in recent years was sown for the 1965 harvest—2.54 million acres—when production was also a post-war record at 4.11 million tons. Yields have been rising since the war, reaching a peak in 1962. Since then the trend has been disappointing. Wheat yields have been affected by the spread of diseases, pests and grass weeds which have followed the practice of intensive cereal growing. Nevertheless, the group believes that yields will renew their upward trend, albeit at a slower rate—the provisional figure for 1967/8 suggests that this is already happening. Important contributory factors to this would be the probable adoption of higher yielding varieties, and a greater awareness of the value of break crops on yields of following cereal crops. The group also believes that the recent unresponsiveness of yields was partly the consequence of unusually mild

winters which enabled disease organisms to survive. The yield forecast for 1972/3 must also take account of the wheat acreage to which it relates: any substantial increase in the total acreage would tend to depress yields, because the expansion would bring in less suitable land and because the proportion of spring wheat (which is lower yielding than winter wheat) would tend to rise. The group believes that, if the wheat acreage remained at the level of recent years, the average yield by 1972/3 would rise to about 35 cwt an acre; but that it would reach only about 34½ cwt if the acreage were to increase by a further 50 per cent. The key figures for the past few years are shown in Table 11.

**Table 11** Acreage, production and yields of wheat in the United Kingdom annual averages

	1956/7-58/9	1961/2-63/4	1964/5-66/7	1967/8*
Acres (million)	2.2	2.0	2.3	2.3
Production (million tons)	2.7	3.2	3.8	3.8
Yield (cwt per acre)	24.9	31.3	32.3	33.3

\* Provisional

106 The production of high quality wheat for milling, such as the new variety Maris Widgeon, offers substantial scope for import saving. Yields of this variety are fully comparable to those of the most widely grown varieties of ordinary wheat currently in use. Provided such quality wheats can continue to earn a premium on the price of ordinary wheat they should not lose their attraction in comparison with higher yielding ordinary varieties which are now being developed. The group received evidence that a further ½m tons of home grown quality wheat could be used by the British milling industry by 1972/3 and proposes, therefore, that this quantity, which represents no less than one-sixth of total imports of wheat for milling, should be the target figure for the additional production of quality wheats by 1972/73. In addition to direct displacement of imported wheat by additional home production, a substantial part of the drop of 180,000 tons in demand for quality wheat as a result of the falling consumption of bread will represent a saving of imported wheat.

107 A more substantial import saving would result from the expansion of home production of wheat for animal feed. There is considerable scope for flexibility in the make-up of compound rations; provided essential nutrients are available, price becomes the major determinant of the ingredients used. Supplements can to some extent make up for deficiencies in nutrients, giving additional scope for flexibility. It is generally agreed that wheat could effectively be used to replace maize and sorghums in compound rations. (Barley is also to a significant degree suitable as a substitute, as it certainly appeared to have been during the 1967 dock strike.).

#### *Conclusions on wheat*

108 The group concludes that the wheat acreage should be expanded by about 1 million acres to 3.3m acres by 1972/3. At 34½ cwt an acre, total production of wheat would then be in the region of 5.7m tons, or nearly 2m tons more than 1967/8. Of this additional production, ½m tons would replace imported filler wheat; the remainder would be likely in part to replace imports of feed wheat,

maize or sorghums as well as to meet part of the additional feed requirement that would arise from the postulated expansion in livestock production.

### *Barley*

109 United Kingdom production of barley increased threefold in the last ten years. Although an export trade in barley has developed, not all imports of barley have been eliminated. Most of these imports are, however, believed to consist of Canadian barley with a high diastase content for use in the distilling industry. In the past, difficulties in supplying N Ireland from the mainland have accounted for most of the remaining feed barley imports (as also for some imports of feed wheat) but devaluation may alter this situation. Though falling in recent years, imports rose sharply in 1967 and cost £5.6m.

110 Acreage expanded just over two-and-a-half times between 1956/7 and 1966/7. Yields also increased over the period, but in recent years various factors, including particularly the effects of mono-culture and disease, may well have brought a check to the upward trend.

**Table 12** Acreage, production and yields of barley in the United Kingdom annual averages

	1956/7-58/9	1961/2-63/4	1964/5-66/7	1967/8*
Acres (million)	2.6	4.2	5.5	6.0
Production (million tons)	3.0	5.8	8.0	9.2
Yield (cwt per acre)	23.2	27.7	29.1	30.7

\* Provisional

111 No major breakthrough is expected in new varieties of barley by 1972/3. Moreover, the expansion of wheat will tend to take place on the better land, so that barley will tend to be pushed on to poorer land. Nevertheless, the better varieties introduced in recent years have not yet been fully taken up, and the other factors likely to benefit wheat will also benefit barley, including the gains from break crops and measures to counter pests and diseases. The group believes, therefore, that a rise to 32 cwt an acre could be expected by 1972/3.

112 Whilst the first call on additional barley would be to meet the additional feed requirement postulated by the livestock group, any barley not so consumed could be used in substitution for imported maize and sorghums since, as noted above, barley and wheat are to a significant degree inter-changeable in livestock rations.

113 There would also be a small additional demand of about 150,000 tons of barley by 1972/3, mainly for the brewing and distilling of alcoholic drinks. This ignores the 60,000 tons or more of Canadian barley at present imported by distillers; as a home produced variety with the right diastase characteristics is not yet available, it is not envisaged that distillers will voluntarily replace these particular imports by 1972/3. It also ignores the imported maize syrups used in brewing, which could be replaced by malt. The group urges that the brewers and distillers should be asked to take positive steps to curtail their use of these imported materials.

114 One factor operating to limit the demand for barley is the possibility that the export market developed in recent years will diminish, as European coarse grain output builds up. It is expected, however, that some export demand for

malt and for malting barley will continue. This possible development has been assumed to reduce total barley exports by up to  $\frac{1}{2}$ m tons below the 1966/7 peak figures by 1972/3.

#### *Conclusions on barley*

115 The group concludes that if wheat growing were to expand to the extent suggested above, the barley acreage would show only a moderate increase from 6.0m acres to about 6.5m acres by 1972/3. At 32 cwt an acre, barley production would then total 10.4m tons, or about 1.2m tons more than in 1967/8; but assuming lower exports, about 1  $\frac{1}{2}$ m tons more would be available on the home market. Most would go to meet the growth in demand for livestock feed, but some could be used for direct displacement of maize and sorghums.

#### *Oats*

116 After a lengthy period of decline, the oat acreage showed a small increase from 0.9 to 1.0 million acres in 1967. This acreage compares with the 2.6m acres down to oats in 1956/7. Production fell less sharply than acreage, as there was a useful improvement in yields from 19.4 to 24.4 cwt an acre over the ten-year period. Imports, though never substantial, have also fallen; in 1966/7 they amounted to 25,000 tons, costing £3 million.

**Table 13** Acreage, production and yields of oats in the United Kingdom/annual averages

	1956/7-58/9	1961/2-63/4	1964/5-66/7	1967/68*
Acreage (million)	2.4	1.5	1.0	1.0
Production (million tons)	2.3	1.7	1.2	1.3
Yield (cwt per acre)	19.0	22.2	24.0	26.5

\* Provisional

117 With relative freedom from disease, and with new higher yielding varieties available, oats are a valuable break crop. For this reason, an increase in the acreage down to oats is to some extent complementary to a rise in the wheat acreage. By 1972/3, yields should improve to around 29 cwt an acre. Unless a huskless oat is developed, there is little prospect of oats being used on any scale by animal feed compounders. Any additional output will therefore need to be used on farms for livestock feeding, a development which might be reinforced by the expanding bean acreage.

#### *Conclusions on oats*

118 The group concludes that the acreage of oats should increase by  $\frac{1}{2}$ m acres to about 1.2m acres by 1972/3. On the basis of average yields of 29 cwt an acre by 1972/3, the increase in output would be rather less than  $\frac{1}{2}$ m tons a year.

#### *Other cereals*

119 The group welcomes the research which is being undertaken into the possibilities of developing suitable varieties of maize for Britain. While every encouragement should be given to this work it is unlikely to produce significant results by 1972/3. Acreages of mixed corn and rye are now very small: the group assumes that these crops will continue to be of little significance.

### *General*

120 The increase in cereals production proposed by 1972/3 amounts to about 3½m tons above the provisional figure for 1967/8, giving a total production by 1972/3 of approximately 18m tons. The group considers such an expansion to be well within the scope of British agriculture: it has reached this view both on the basis of a detailed examination of acreages, county by county, and on the knowledge that a trend in production no higher than that achieved in recent years would lead to a total cereals production of about 17m tons by 1972/3.

121 Price considerations apart, the way that the additional 3½m tons would best be divided between wheat, barley and oats would depend upon a number of factors, important among which are the level and composition of livestock feed and the likely geographical pattern of expansion. The group does not wish to encourage the growing of wheat to the point where it would give significantly lower yields than barley or to the point where imports of barley could possibly become necessary. Account must also be taken of the marked degree of interchangeability in feedingstuffs between wheat and barley, depending on price. Having said this, the group nevertheless finds that wheat is the better substitute for maize, and its expansion makes possible the replacement of imported filler and feed wheat. There is, therefore, better scope for saving imports, existing or potential, by a larger increase in the acreage of wheat than of barley. The group's interest in wishing to stem the tide of the decline in oats, and even to encourage a slight upsurge, arises from the value of this cereal as a change crop, leading to higher production of other cereals that follow.

122 These matters apart, the group recognises that the wide variations in soil and climate lead inevitably to variations in methods and intensiveness of farming systems and must greatly influence the choice of cereal grown. As the group wishes to see a much greater use of break crops, because of their advantages in raising yields of subsequent cereal crops, there would be little scope for increasing the cereal acreages in the traditional cereal growing areas of the eastern counties of England. These areas have contributed only about a quarter of the increase in cereals acreage in the last five years, the rest of which has come almost equally from the midland and southern counties of England and from the rest of the United Kingdom. The group sees these trends continuing, with cereal growing reaching out towards the far west and north. In these comparatively wetter areas, where the reserves of fertility of the newly ploughed-out grass should give satisfactory yields, the cultivation of spring crops would be more suitable than the growing of winter wheat. There should thus be an added emphasis on wheat in the drier counties to the east and south.

123 Finally, the group wishes to stress the importance of marketing home-grown grain in accordance with demand. In past years, imports of cereals have occurred when home supplies were potentially available, because these supplies were kept in store either in the hope of a rise in price later in the marketing season or to take advantage of storage incentives. With the prospect of increased home production, there will be even greater need to match supply to demand.

### **Cost in resources**

#### *Acreage*

124 The additional acreage required to meet the above programme by 1972/3 would be as follows:

Table 14 Proposed increase in cereals acreage/million acres

	1967	1972	Increase
Wheat	2.3	3.3	1.0
Barley	6.0	6.5	0.5
Oats and others	1.1	1.3	0.2
Total	9.4	11.1	1.7

This represents an increase of about 18 per cent in the acreage down to cereals. It would have to come largely, if not entirely, from grassland.

#### *Labour*

125 The expansion in the cereals acreage would affect mainly the mixed and livestock farming areas. The group believes that, because of the rapid pace of mechanisation and the increasing capacity of machines in the predominantly arable areas, it may be possible in these areas to dispense with labour at a faster rate than before; but in the mixed and livestock farming areas, there might be need for some slowing down in the rate of outflow of labour.

#### *Capital costs*

126 The group has considered the different levels of capital input required for different parts of the country. In predominantly cereal growing areas, for instance, it is envisaged that 70 per cent of any expansion would be absorbed by the present number of combines. In the livestock and mixed farming areas the proportion absorbed would be rather less. On this basis the cost of extra combines would total approximately £9m. Depreciated over seven years, this would be an annual cost in 1972/3 of £1.3m per year. Other field machinery would cost approximately £3m or £0.3m per year depreciated. For storage, the group estimates that extra capital requirements would be some £20m by 1972/3, or £1.3m per year depreciated over fifteen years. This assumes that 70 per cent of the additional production (or 2½m tons) would be stored at peak, at an average cost of £8 a ton. The additional drying capacity, mainly in the higher moisture areas, would require a further £4m or £0.4m depreciated over ten years. Total capital costs for the cereal expansion by 1972/3 would therefore be £36m or £3.3m per year depreciated.

#### *Variable costs*

127 Total variable costs, under 1972/3 farming practice, and at 1967 prices, would be about £25m per year. Gross fertiliser costs, before deduction of subsidy, would be £13m, including nearly £4m in respect of increased applications on existing acreage. For seed, approximately 200,000 tons would be required, valued at approximately £5m and this would come out of the total production envisaged. Sprays are forecast to cost £1½m, fuel and power £3½m and machinery repairs £2m per year.

#### *Import saving*

128 The gross saving in imports that would result from the above programme of expansion would arise partly as a reduction in the existing level of cereal imports, and partly as a contribution to the feed requirements of the expanded livestock population which, if not met by additional home production, would

have to be imported. In direct substitution for existing imports there is the  $\frac{1}{2}$ m tons of quality wheat which would replace an equivalent amount of imported filler wheat, costing £15m. The remaining 3m tons of additional cereals produced would, on the basis of the livestock group's calculations, be used to the extent of  $2\frac{1}{2}$ m tons to feed the additional livestock, leaving  $\frac{1}{2}$ m tons (as well as  $\frac{1}{2}$ m tons currently being exported) to replace imported feed wheat, maize or sorghums. At current import prices, the 3m tons would represent a further import saving of about £75m. The total gross import saving after allowing for seed would, therefore, be about £85m—a figure that would not be substantially changed if the requirement of additional livestock feed proved to be either greater or less than the  $2\frac{1}{2}$ m tons mentioned above. Imported inputs have been estimated at £6 $\frac{1}{2}$ m (fertilisers £3m, fuel and oil £2m, machinery *etc* £1 $\frac{1}{2}$ m), leaving a total net import saving of £78 $\frac{1}{2}$ m.

129 Though not in any way related to the proposed expansion programme, the reduction of some 180,000 tons in demand for wheat for breadmaking will also serve to reduce the level of imports of wheat, directly, and other grain, indirectly, by about £5 $\frac{1}{2}$ m in addition to the gross saving of some £85m calculated in paragraph 128.

### Summary

130 The group recommends an expansion of 3.5m tons in production, which, after allowing for lower exports of barley, would mean an additional 4.0 million tons of cereals for the home market.

**Table 15** Proposed increase in cereals production/million tons

	1967/8	1972/3	Increase
Wheat	3.8	5.7	+ 1.9
Barley	9.2	10.4	+ 1.2
Oats and others	1.5	1.9	+ 0.4
<b>Total</b>	<b>14.5</b>	<b>18.0</b>	<b>+ 3.5</b>

This level of increase would require an expansion of 1.7m acres of cereals over the June 1967 acreage. Capital costs are calculated at £36m, or £3.3m a year depreciated, and variable costs at £25m a year. The total gross import saving contribution would be of the order of £85m a year by 1972/3 and the net import saving contribution would be about £78 $\frac{1}{2}$ m a year.

**Table 16 Acreage, production and yields of cereals in the United Kingdom, 1956/7 to 1967/8**

	1956/7	1957/8	1958/9	1959/60	1960/1	1961/2
<i>June acreage—'000 acres</i>						
Wheat	2,293	2,113	2,208	1,929	2,102	1,827
Rye	26	26	23	14	19	19
Barley	2,323	2,622	2,755	3,059	3,372	3,828
Oats	2,564	2,348	2,217	2,032	1,974	1,733
Mixed corn	418	336	281	232	203	147
<b>Total</b>	<b>7,624</b>	<b>7,445</b>	<b>7,484</b>	<b>7,266</b>	<b>7,670</b>	<b>7,554</b>
<i>Production—'000 tons</i>						
Wheat	2,845	2,683	2,711	2,785	3,064	2,573
Rye	25	24	21	13	18	18
Barley	2,800	2,957	3,170	4,016	4,241	4,974
Oats	2,486	2,145	2,138	2,187	2,058	1,822
Mixed corn	407	325	275	259	219	169
<b>Total</b>	<b>8,563</b>	<b>8,134</b>	<b>8,315</b>	<b>9,260</b>	<b>9,600</b>	<b>9,556</b>
<i>Yields—cwt per acre</i>						
Wheat	24.8	25.4	24.6	28.9	29.1	28.2
Rye	19.4	18.9	18.6	19.2	19.9	19.3
Barley	24.1	22.6	23.0	26.3	25.2	26.0
Oats	19.4	18.3	19.3	21.6	20.9	21.1
Mixed corn	19.5	19.4	19.6	22.4	21.7	23.1
	1962/3	1963/4	1964/5	1965/6	1966/7	1967/8*
<i>June acreage—'000 acres</i>						
Wheat	2,256	1,928	2,206	2,535	2,238	2,305
Rye	17	21	21	18	10	11
Barley	3,987	4,713	5,032	5,395	6,130	6,027
Oats	1,519	1,295	1,125	1,014	907	1,012
Mixed corn	125	99	80	73	73	88
<b>Total</b>	<b>7,904</b>	<b>8,056</b>	<b>8,464</b>	<b>9,035</b>	<b>9,358</b>	<b>9,443</b>

\* Provisional



Table 16 *continued*

	1962/3	1963/4	1964/5	1965/6	1966/7	1967/8*
<i>Production—'000 tons</i>						
Wheat	3,911	2,998	3,733	4,105	3,420	3,836
Rye	17	22	25	21	11	12
Barley	5,773	6,599	7,404	8,062	8,586	9,242
Oats	1,747	1,438	1,325	1,213	1,102	1,340
Mixed corn	154	118	101	91	93	117
<b>Total</b>	<b>11,602</b>	<b>11,175</b>	<b>12,588</b>	<b>13,492</b>	<b>13,212</b>	<b>14,547</b>
<i>Yields—cwt per acre</i>						
Wheat	34.7	31.1	33.8	32.4	30.6	33.3
Rye	20.3	21.3	23.4	23.7	22.0	22.5
Barley	29.0	28.0	29.4	29.9	28.0	30.7
Oats	23.1	22.3	23.6	24.0	24.4	26.5
Mixed corn	24.8	23.8	25.3	24.8	25.7	26.5
* Provisional						

**Table 17 Production and imports of cereals in the United Kingdom, 1956/7 to 1967/8 '000 tons**

	1956/7			1957/8		
	Home	Imports	Total	Home	Imports	Total
Wheat (a)	2,845	4,917	7,762	2,683	5,031	7,714
Rye	25	8	33	24	3	27
Barley	2,800	1,058	3,858	2,957	1,284	4,241
Oats	2,486	21	2,507	2,145	131	2,276
Mixed corn	407	—	407	325	—	325
Maize	—	1,492	1,492	—	1,922	1,922
Sorghums	—	189	189	—	188	188
<b>Total</b>	<b>8,563</b>	<b>7,685</b>	<b>16,248</b>	<b>8,134</b>	<b>8,559</b>	<b>16,693</b>

	1958/9			1959/60		
	Home	Imports	Total	Home	Imports	Total
Wheat (a)	2,711	5,216	7,927	2,785	4,397	7,182
Rye	21	8	29	13	9	22
Barley	3,170	1,123	4,293	4,016	815	4,831
Oats	2,138	182	2,320	2,187	25	2,212
Mixed corn	275	—	275	259	—	259
Maize	—	2,771	2,771	—	3,086	3,086
Sorghums	—	630	630	—	555	555
<b>Total</b>	<b>8,315</b>	<b>9,930</b>	<b>18,245</b>	<b>9,260</b>	<b>8,887</b>	<b>18,147</b>

	1960/1			1961/2		
	Home	Imports	Total	Home	Imports	Total
Wheat(a)	3,064	4,630	7,694	2,573	4,609	7,182
Rye	18	9	27	18	6	24
Barley	4,241	950	5,191	4,974	531	5,505
Oats	2,058	47	2,105	1,822	42	1,864
Mixed corn	219	—	219	169	—	169
Maize	—	3,044	3,044	—	3,938	3,938
Sorghums	—	352	352	—	549	549
<b>Total</b>	<b>9,600</b>	<b>9,032</b>	<b>18,632</b>	<b>9,556</b>	<b>9,675</b>	<b>19,231</b>

(a) Imports include flour as wheat equivalent

Table 17 continued

	1962/3			1963/4		
	Home	Imports	Total	Home	Imports	Total
Wheat(a)	3,911	4,182	8,093	2,998	4,534	7,532
Rye	17	5	22	22	6	28
Barley	5,773	292	6,065	6,599	419	7,018
Oats	1,747	53	1,800	1,438	21	1,459
Mixed corn	154	—	154	118	—	118
Maize	—	3,831	3,831	—	3,431	3,431
Sorghums	—	394	394	—	260	260
<b>Total</b>	<b>11,602</b>	<b>8,757</b>	<b>20,359</b>	<b>11,175</b>	<b>8,671</b>	<b>19,846</b>

  

	1964/5			1965/6		
	Home	Imports	Total	Home	Imports	Total
Wheat(a)	3,733	4,120	7,853	4,105	4,591	8,695
Rye	25	4	29	21	8	29
Barley	7,404	274	7,678	8,062	192	8,254
Oats	1,325	23	1,348	1,213	33	1,246
Mixed corn	101	—	101	91	—	91
Maize	—	3,140	3,140	—	3,490	3,490
Sorghums	—	386	386	—	512	512
<b>Total</b>	<b>12,588</b>	<b>7,947</b>	<b>20,535</b>	<b>13,492</b>	<b>8,826</b>	<b>22,317</b>

  

	1966/7			1967/8*		
	Home	Imports	Total	Home	Imports	Total
Wheat(a)	3,420	4,110	7,530	3,836	4,023	7,859
Rye	11	9	20	12	10	22
Barley	8,586	188	8,774	9,242	180	9,422
Oats	1,102	25	1,127	1,340	20	1,360
Mixed corn	93	—	93	117	—	117
Maize	—	3,334	3,334	—	3,608	3,608
Sorghums	—	496	496	—	250	250
<b>Total</b>	<b>13,212</b>	<b>8,162</b>	<b>21,374</b>	<b>14,547</b>	<b>8,091</b>	<b>22,638</b>

\* Provisional

(a) Imports include flour as wheat equivalent

## Introduction

*Relative importance*

131 The potato acreage accounted for 6 per cent of the total tillage acreage in the three years to 1967/8 and the value of sales off farms, at £90 million a year, represented 24 per cent of the total value of sales of farm crops, and 5 per cent of total farm sales.

*Balance of home production and imports*

132 In normal years imports of potatoes are confined to new potatoes, costing £12 million on average in 1964-6, plus a few seed potatoes from the Irish Republic, costing about £200,000. These figures compare with sales of the home crop, as shown above, of £90 million. Imports of new potatoes are relatively stable in quantity, though in seasons when the home main crop is short or the new crop delayed, imports may rise sharply, as in 1962 and to a lesser extent in 1967. Ignoring supplies from the Channel Islands (which count as internal United Kingdom trade) imports have fluctuated during the past few years between 240,000 and 310,000 tons.

133 In contrast to the comparative stability of trade in raw new potatoes and the prohibition, except in times of shortage, of imports of main crop potatoes, there is a small but growing import of potatoes in processed form. The Overseas Trade Accounts do not separately state the whole of such imports, but estimates given to the group suggest that in 1967 the total of such imports exceeded £3m and was rising rapidly.

**Table 18** Acreage and supplies of potatoes in the United Kingdom/million acres and million tons/annual averages

	1956/7-58/9	1961/2-63/4	1964/5-66/7	1967/8*
Acreage	0.85	0.74	0.73	0.71
Production	6.26	6.50	6.96	7.09
Imports				
New(a)	0.27	0.33	0.28	0.35
Other	0.24	0.11	0.01	0.01
Total	0.51	0.44	0.29	0.36
Total supplies	6.77	6.94	7.25	7.45

(a) Including supplies from Channel Islands

\* Provisional

134 Demand for potatoes for human consumption has been stable at 195-200 lb a person a year, giving a market of about 5.1 million tons. In addition some 0.8m tons are required for seed for the current acreage, and a slightly larger quantity either does not leave the farm or is unsuitable for sale. Rising population is putting up total human demand slightly, so that by 1972/3 total human demand will be about 5.2 million tons, assuming no change in consumption a

**Table 19 Value of imports of raw potatoes into the United Kingdom/£m**

	1962	1963	1964	1965	1966	1967
New	22.5	12.1	10.9	12.1	13.0	16.3
Seed	0.2	0.2	0.3	0.2	0.2	1.2
Other	6.0	5.1	0.1	0.0	0.0	
<b>Total</b>	<b>28.7</b>	<b>17.4</b>	<b>11.3</b>	<b>12.3</b>	<b>13.2</b>	<b>17.5</b>

*Notes:*

(1) Excluding supplies from Channel Islands

(2) In addition, imports of processed potatoes in 1967 are estimated to have been worth over £3m, and to be rising steeply

head. This calculation implies a total production of 7.0 million tons, less any economies resulting from better utilisation of the crop.

135 Within the total human market of 5.1m tons demand is increasing rapidly for processed potatoes—which in 1967 accounted for about one-eighth of total human consumption—but is declining slightly for raw potatoes. Crisps (including mini-chips) are the main processed product; consumption in 1967 was equivalent to about 370,000 tons of potatoes and rising by about 25,000 tons a year. Most of this demand is independent of demand for raw potatoes, but the rapidly rising demand for other forms of processed potatoes (dehydrated potato, canned new potatoes, frozen products) is almost entirely at the expense of raw potatoes. Taking all these factors into account, the total demand for potatoes is likely to remain unchanged.

### **Processed potato imports**

#### *Risk of heavier imports*

136 This increase in demand for processed potatoes has led to a sharp rise in imports and unless steps are taken to meet the new demand from home production imports of processed potatoes—which escape the restrictions on imports of raw maincrop potatoes—could make substantial inroads into the level of home production by 1972/3. The situation varies from product to product.

#### *Crisps*

137 For the crisps market, acreage of the variety Record has risen from 4,000 acres in 1955 to 28,000 acres in 1967. The group notes the research being carried out to produce alternatives to Record with higher yields and of better crisping quality, but at the same time developments in processing techniques are said to widen the range of acceptable varieties. Some potatoes have always been imported to fill the gap between the old and the new season's crop. However, improvements in storage techniques have reduced the period during which crispers have to depend on imports, and the quantity imported is little changed despite the heavier demand for crisps. Here research on storage to improve the keeping qualities of potatoes in store is desirable in order to eliminate these imports to the greatest possible extent.

#### *Dehydrated potato*

138 The market for dehydrated potato gives rise to much more concern. This product is being imported on an increasing scale and, as dehydrated potato

directly replaces ware potatoes, these imports reduce consumption of the home crop. Imports mainly from Canada, the United States and the Irish Republic, are estimated to have risen from £½m in 1966 to over £1½m in 1967 and are likely to exceed £3m in 1968. Manufacturers claim that the price of these imports limits the price which they can pay for home produced raw potatoes to £10-£14 a ton, depending on quality. It is likely to remain uneconomic to supply first-quality graded potatoes at these prices, but certain second grade potatoes produce acceptable raw material, provided dry matter content is suitable and there is not too much wastage in peeling. An alternative approach, already contemplated by some dehydrators, is the contract buying of high-yielding varieties on an 'as grown' basis.

139 Although dehydrated potato probably accounted in 1966 for less than 2 per cent of the total market in Britain for potatoes for human consumption, considerable growth is anticipated for this product. If met entirely by imports, these could rise, according to one estimate, to as much as £10m by 1972/3. Imports of this magnitude would displace about 250,000 tons of raw potatoes from the home crop. Sharp though such an expansion in demand would be, dehydrated potato would still represent only 5 per cent of total human consumption. In the United States this product accounted for 12½ per cent of total human consumption of potatoes in 1965, having doubled in the three years from 1962.

140 Factory capacity in Britain is believed to be capable currently of dehydrating 50,000 tons of raw potatoes, producing 7,000 tons of product, but the processing industry is understood to be considering additional capacity which would enable it to handle a substantially larger quantity. To encourage an increase in capacity, it is essential that the Potato Marketing Board should have regard to the needs of processors for a guarantee of continuity of supply of suitable potatoes. It is important that the Board should pursue all possible ways of ensuring the maximum utilisation of the crop, and thus remove an unnecessary burden on the balance of payments. The setting up of grading stations, which would enter into contracts with processors for the regular supply of suitable outgrades could be one way of achieving this result. Once these steps are taken, processors should ensure that factory capacity is sufficient to meet the whole of the market for this product.

#### *Frozen products*

141 Imports of frozen products, equivalent to about 15,000 tons of raw potatoes, were probably worth about £1m in 1967, and may have provided about 40 per cent of supplies of such products in the United Kingdom. Demand is expected to rise rapidly by 1972/3. The group understands that a wider range of varieties can be used for freezing than for dehydration, but again there is need for producers to organise their marketing to meet the needs of this completely new industry. Present factory capacity is believed to be capable of handling 20,000 tons of raw potatoes, but when two recently-announced new factories become operational, capacity is likely to exceed 100,000 tons of raw potatoes. Imports should then fall to a low level or be eliminated.

#### *Canned new potatoes*

142 It is estimated that, in 1967, canners used about 5,000 tons of home grown potatoes, plus about 25,000 tons of imported new potatoes which cost over £1m. In addition, 5,000-10,000 tons of potatoes were imported already canned, at a cost of £½m-£1m. Estimates of future demand vary widely, but the trend is sharply upwards and imports will cost several million pounds by 1972/3 if more

home produced potatoes cannot be used. The chief factor limiting the use of home grown potatoes is the problem of finding suitable supplies to meet the needs of canning lines throughout the year. There is need for co-operative action between growers, scientists and canners to fill this gap.

#### *New potatoes*

143 Apart from the demands of the canning industry, some small increase in demand for raw new potatoes can be expected by 1972/3. This may induce a rise in imports, mainly from Mediterranean countries, which may be facilitated over the next few years by improvements in plant health. On the other hand, supplies to the United Kingdom market may be limited by growing competition for Mediterranean supplies from other parts of northern Europe.

### **Yields and acreage**

#### *Yields*

144 The trend in yield is sharply upward. The United Kingdom average for the three seasons 1964/5-66/7 was 9.6 tons an acre, and in 1967/8 about 10.0 tons, against only 7.3 tons in 1956/7-58/9. The group believes there are good grounds for expecting a continuation of the past trend and that the yield in 1972/3 is likely to approach 11 tons an acre. New varieties are available which out-yield the traditional Majestics and King Edwards, and these are likely to be increasingly adopted. Improved methods of cultivation, pest and disease control, chitting, better application of fertiliser, the greater use of irrigation, more complete harvesting, all tend in this direction. In so far as some new varieties are resistant to the A-strain of eelworm this also results in higher yields, but it is unlikely to be a significant factor by 1972/3.

**Table 20** Yield of potatoes in the United Kingdom/tons per acre/annual averages

	1956/7-58/9	1961/2-63/4	1964/5-66/7	1967/8*
First earlies	5.8	5.9	6.6	6.5
Main crop and second earlies	7.6	9.4	10.1	10.5
Total crop	7.3	8.8	9.6	10.0

\* Provisional.

#### *Acreage*

145 It was calculated above that the supply of potatoes in 1972/3 needed to be about 7.0 million tons, less economies resulting from more efficient utilisation of the crop. Imports of new potatoes will account for at least 0.3 million tons, and better utilisation of seconds and improved harvesting will perhaps reduce wastage by 0.1 million tons. Home production will thus need to be no more than 6.6 million tons even if the whole of the demand for processed potatoes is met from home supplies. At 11 tons to the acre only 600,000 acres would be required; this represents a decrease of 110,000 acres on the 1967 acreage.

146 Some allowance must, however, be made for years when yield falls below average. Taking a three-year rolling average as the norm, and comparing each annual yield with the appropriate norm, the largest annual yield deficit registered

in the ten-year period 1957-66 was 0.6 tons per acre in 1958. To insure against such a deficit occurring in 1972, there would be need of a reserve of 35,000 acres over the basic 600,000 acres mentioned above. During the period 1957-66, there were in fact six years when the average yield fell below the three-year norm, and if this total deficit is averaged over the ten-year period it amounts to 0.17 tons per acre. On a basic acreage of 600,000 this would represent an average annual deficit of approximately 100,000 tons which, if valued in the range £25-£30 a ton, would amount to £2.5m-£3.0m. Taking this sum as the potential gross import cost and applying it to the reserve acreage of 35,000, each of the reserve acres would be worth £70-£85 a year in potential gross import saving. This suggests that these reserve acres would make as great a contribution to import saving as they would be likely to make if devoted to any alternative arable crop. The group has therefore taken 635,000 acres as the appropriate size of the potato acreage for 1972/3. (The assumed import values of £25-£30 a ton may seem high, but it has to be recognised that potato supplies on the Continent are tending to decline and the presence of disease limits the number of countries from which supplies could be obtained.)

### **Cost in resources**

147 The group's terms of reference require it to estimate the resources required only when it proposes an expansion of output in order to save imports. As the group does not propose such an extension for potatoes—indeed a reduction in acreage is possible—it does not fall to the group to make any calculation of resources. Nevertheless it feels it must draw attention to the fact that, while the variable resources required for the smaller acreage will fall by some £3.7m a year, a considerable spending on capital equipment will be necessary in maintaining the present level of output, as the growing and harvesting of potatoes is rapidly becoming a capital intensive activity rather than depending heavily on labour. There is likely to be a further significant fall in the manpower needs of this sector of the industry. As an example of the scale of the economies being achieved, one forecast is the man-hours an acre may fall by 1972/3 to 35-40, compared with 140 man-hours an acre in 1960.

### **Conclusion**

148 The potato market is undergoing a rapid change. The proportion purchased as dehydrated, frozen and canned potatoes—which directly replace raw potatoes—is still small but increasing sharply. Total consumption of raw potatoes together with those forms of processed potatoes is falling slightly. Offsetting this fall, however, is a rising demand for crisps, consumption of which is, in the main, additional to that of other forms of potato. Whilst total consumption of potatoes a head is thus unchanged, demand for home produced ware potatoes is suffering because much of the supply of dehydrated, frozen and canned potatoes is obtained from abroad, at a cost which could rise to £10m or beyond by 1972/3. Provided the growing side of the industry takes steps to organise the marketing of potatoes, so that processors can receive a regular supply of suitable potatoes at competitive prices, there are good prospects that additional processing capacity will be built in Britain, to avoid unnecessary imports. Decisions to build additional capacity have, in fact, already been taken by the freezers and similar decisions are expected in the dehydrating sector, whilst closer links are developing between growers and canners of new potatoes. Thus there are hopes that, with collaboration between growers and processors, the present upsurge in imports may prove to be a temporary phenomenon associated with the initial



development of these new markets for processed potatoes.

149 The group has not commented upon the possibility of developing the processing of potatoes for the production of potato starch because it considers that the first priority should be to replace potential imports of potatoes in other processed forms in the short period to 1972/3.

## Sugar beet

### Introduction

#### *Relative importance*

150 The sugar beet acreage accounted for 4 per cent of the total tillage acreage in the three years 1965/6-67/8, and the value of sales off farms, averaging £41m over the three years, represented 11 per cent of the value of sales of farm crops and 2 per cent of total farm sales.

**Table 21** Acreage and supplies of sugar in the United Kingdom/million acres and million tons/annual averages

	1956/7-58/9	1961/2-63/4	1964/5-66/7	1967/8*
Production acreage	0.43	0.42	0.44	0.45
Production of sugar beet	5.15	5.50	6.47	6.78
Production of sugar (refined basis)	0.66	0.73	0.87	0.87
Gross imports (refined basis)	2.50	2.23	2.04	2.02
Exports† (refined basis)	0.62	0.33	0.31	0.32
Net supplies (refined basis)	2.54	2.63	2.60	2.57

\* Provisional

† Calendar year figures: eg 1967 shown under 1967/8

**Table 22** Value of imports and exports of sugar/£million

	1962	1963	1964	1965	1966	1967
<i>Imports</i>						
Raw	91.2	136.9	142.0	93.2	96.3	92.1
Refined	2.7	9.6	3.5	1.3	1.4	1.2
Total	93.9	146.5	145.5	94.5	97.7	93.3
Exports—total	10.2	27.2	30.5	11.8	8.8	9.0

#### *Balance of home production and imports*

151 Government policy is to limit the production of beet sugar in Britain to the amount the United Kingdom market can absorb, bearing in mind existing commitments to purchase Commonwealth sugar and the unpredictable annual

variations in yield from beet. The selective expansion programme, therefore, provides that the home industry should supply part of any increasing demand within the existing factory capacity and without raising international problems. Under the terms of the Commonwealth Sugar Agreement, imports equivalent to about 1.6 million tons of refined sugar are made at negotiated prices; the balance of imported supplies (about 0.1-0.2 million tons) is bought at world prices, either from the Commonwealth or from foreign countries. The operations of the Sugar Board ensure that sugar from home-grown beet, sugar from Commonwealth countries at negotiated prices, and sugar at world prices (plus Commonwealth preference where applicable), are sold at a common price. Similar arrangements apply to sugar imported after refining or used as an ingredient in imported manufactured food and drink. Exports of refined sugar are made from raw sugar bought in the free market at world prices.

152 During the three years to 1966/7 home production, averaging 921,000 tons a year in terms of raw sugar, accounted for about 30 per cent of total United Kingdom supplies (including sugar exported either as such or as an ingredient of prepared food and drink). In terms of United Kingdom consumption (*ie* excluding exports) home production provided about one-third of requirements.

### Prospects for expansion

#### *Yield of beet*

153 The trend in the yield of beet per acre has been upward for a lengthy period and in the last twenty years yields have improved by about 50 per cent. The trend is likely to continue upward, but there may be some slackening of the rate of increase because of growth in the use of mechanical harvesters and of monogerm varieties. These varieties, which are being developed because they reduce the labour required in cultivation, do not equal in yields the current diploid and polyploid varieties, though it is expected that they will do so shortly. On the basis of existing trends an increase in the yield of beet to 15.3 tons an acre may confidently be expected on average by 1972/3, compared with 14.6 tons on average in the three years to 1966/7. The trend over the last decade has been as follows.

**Table 23** *Yield of sugar beet in the United Kingdom/tons per acre/annual averages*

<i>1956/7-58/9</i>	<i>1961/2-63/4</i>	<i>1964/5-66/7</i>	<i>1967/8</i>
12.0	13.0	14.6	15.5

154 It would, of course, be possible to obtain a higher average yield for the country as a whole if there were a greater concentration of acreage in areas where the soil is most suitable for the growing of the crop. This would enable a greater output of sugar to be obtained from the present controlled acreage, or the present level of output to be obtained from fewer acres, thereby releasing land for the production of other import saving crops. Nevertheless maximum yield is not the only consideration; the group recognises that the efficient use of existing capital resources is also a relevant consideration. It is the duty of the British Sugar Corporation to determine its own commercial policy in respect of factory location and closure. The group was concerned about inadequate acreage supplying one factory but received evidence that there could be prospect of

improved performance and that, given an assurance of continuity of factory capacity beyond 1969, the necessary acreage would be forthcoming. If this occurred soon the existing factory would become viable during the period under review and the heavy capital expense of additional factory capacity in England to cope with the present acreage would be avoided.

#### *Sugar content*

155 The sugar content of beet tends to be low in years when yield is high, because weather factors favourable to the growth of beet are usually inimical to the development of high sugar content. There is little evidence of significant long term improvement in sugar content—the high figures for 1963/4 and 1964/5 distort the following averages, and it may be unwise to assume a yield of more than 16.0 per cent in 1972/3.

**Table 24** Sugar content of sugar beet in the United Kingdom/percentages

1956/7-58/9	1961/2-63/4	1964/5-66/7	1967/8
15.49	15.93	16.37	15.81

#### *Extraction*

156 Although there is considerable variation in the proportion of the sugar content extracted from year to year, as well as from factory to factory, the British Sugar Corporation say that this is slowly improving. Thus the group concludes that with a higher extraction rate and improvement in yield of beet and a sugar content of 16.0 per cent the output of refined sugar will rise to 2.1 tons an acre by 1972/3, from an average of 1.97 tons in the three years to 1966/7.

**Table 25** Yield of refined sugar in the United Kingdom/tons per acre/annual averages

1956/7-58/9	1961/2-63/4	1964/5-66/7	1967/8
1.54	1.73	1.97	2.00

#### *Future demand*

157 On the basis of prices ruling in 1966, the demand group projected an increase in demand for sugar in all its uses by 1972/3 of 130,000 tons refined basis, to a total of about 2,760,000 tons. At the suggested average yield of 2.1 tons of refined sugar an acre and after taking account of the increased yield from the existing acreage this would be equivalent to some 45,000 additional acres of sugar beet. However, the demand group's projection did not take account of the possible replacement of sugar by artificial sweeteners and subsequent information also suggests that overall sugar consumption is unlikely to rise by any significant amount during the next few years. Moreover, evidence is becoming available of an underlying decline in household sugar consumption per head.

#### *Proposal*

158 Growing conditions are suitable for the production of sugar beet over a considerably larger acreage than at present, and an expansion in acreage would reduce the volume of imports of sugar in the absence of conflicting international

commitments. Although the terms of the group's study as a whole are such that international commitments should be disregarded, it seems unrealistic to disregard the Commonwealth Sugar Agreement, if only for the practical reason that the Agreement runs until 1974. Thus no suggestion is made for additional beet acreage in the period to 1972/3, except to meet any increase in demand. The group considers, however, that it is not too early to look ahead to the period beyond the existing term of the Agreement and notes that one of the CSA suppliers is not a developing country relying on shipments of sugar for a large part of its export earnings. There is, therefore, a potential import saving after 1974 for which preparations might be put in hand in advance. According to the British Sugar Corporation an additional 40,000-50,000 acres could be provided by existing growers in the eastern counties of England. This acreage is sufficient to make a new factory viable and the group proposes that it should be added to the present contract acreage after 1974.

### Cost in resources

159 On the existing acreage of sugar beet, the increased output by 1972/3 resulting from higher yields would require additional expenditure on fertilisers to the extent of about £300,000 a year. For the additional acreage after 1974 that the group has postulated, there would be expenditure on fertilisers, seeds, sprays and fuel. The cost of the fertilisers is estimated at £600,000 a year, seeds at £200,000, sprays at £200,000 and fuel and similar costs at £140,000. Whilst additional capital expenditure would be unlikely to be necessary for most producers, as existing machinery is frequently underemployed on the existing acreage and expansion by existing producers is envisaged rather than an influx of new producers, more allowance would have to be made for heavier expenditure on repairs. This is put at £100,000 a year. Thus, the total variable costs that would result from the expanded acreage would amount to about £1.2m annually.

160 Substantial economies in the use of labour are already being achieved at both the spring and autumn peaks, and additional labour requirements to cope with the expanded acreage would be likely to be insignificant.

161 Though little or no additional capital would be called for on the farm, the processing of the additional beet would require the investment of some £11m in a new factory. Depreciating the plant (£8m) over twenty years and the buildings (£3m) over forty years, the equivalent annual cost would be just under £½m.

### Import saving

162 Any comparison of the cost of imported and home-produced sugar is best made at the refined sugar stage. On this basis there is very little difference between the cost of Commonwealth Negotiated Price sugar imported and refined here and the cost of home-grown sugar. Both correspond to prices well above the present world level. The average cif price of raw sugar imported from foreign countries at world prices was under £20 a ton in 1967 but world prices have fluctuated violently over the years. Some indication of the range of price movements is given below:—

Table 26 Average free world price of raw sugar/£ per ton London Market cif

1962	1963	1964	1965	1966	1967
£26.0	£71.1	£51.7	£21.1	£17.2	£19.7

likely to be substantially below both the Commonwealth negotiated price and the average cost of sugar from home-produced beet. Thus the question arises: would resources be wasted in the growing of sugar beet in Britain if these low prices continued?

164 The following points are relevant to this issue:

- (a) the world price relates only to comparatively small supplies not subject to some special trading arrangement and in the past few years has been below the cost of production. Thus it is not a reliable indication of efficiency in the use of resources;
- (b) the bulk of United Kingdom imports are made at prices very close to the average cost of home output, and if additional home demand for sugar were to be met from imports, there would be pressure for it to be met by giving larger Negotiated Price Quotas to Commonwealth countries rather than importing at the world price;
- (c) the marginal cost of additional home production to the extent proposed in paragraph 158 is likely to be well below the average cost—see paragraphs 159–160;
- (d) the import saving contribution of sugar beet per acre, at some £100 for the sugar alone (based on Commonwealth negotiated prices), is very high;
- (e) there is, in addition, a substantial extra return in the form of molasses and sugar beet pulp; sugar beet is useful as a break crop in the cereal rotation, and the tops, if not fed to cattle, are beneficial to the soil.

165 In the light of these considerations, it is estimated that an expansion of 45,000 acres of sugar beet after 1974 together with the higher yield from the existing acreage would result in import saving of £7m at Commonwealth negotiated prices (though only £3m at the low 1967 world price). On the same basis it is estimated that the extra output expected from the existing acreage alone in 1972/3—60,000 tons—would result in an import saving of £1–3m a year.

## Conclusion

166 In the light of these considerations the group concludes that there is a strong case for the growing of more sugar beet in Britain. The British grower produces only one-third of the total sugar used in the United Kingdom and the industry is capable of providing a much higher output. Because of the Commonwealth Sugar Agreement, however, the group is not suggesting any expansion in acreage of sugar beet by 1972/3, but recommends that consideration be given to an expansion of about 45,000 acres, linked to a new factory in the eastern counties of England, to come into production after expiry of the existing term of the Commonwealth Sugar Agreement.

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## Peas and beans for human consumption

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### Introduction

#### *Relative importance*

167 Peas and beans for human consumption accounted for 170,000 acres on average in the three years to 1967/8. Their output was valued at nearly £17m a year on average at farm gate prices, about 3 per cent of the value of sales of crops off farms, and 1 per cent of total farm sales.

*Balance of home production and imports*

168 The United Kingdom was approximately 75 per cent self-sufficient for total requirements of peas during the three years 1965-7. The cost of imported peas was on average about £6m a year, of which frozen peas accounted for £2-3m and almost the whole of the remainder was in respect of dried peas. For green beans, virtually the whole of the demand is met from home production; imports are confined to frozen beans, at £1m or less a year. Other leguminous vegetables imported for human consumption include dried beans, such as butter beans, and lentils but these cannot be grown in this country. Their import value is currently £7m per year, predominantly from the United States and Canada.

169 Trends in United Kingdom and output of peas and beans for human consumption are summarised below. After a lengthy period of decline there were signs of a recovery in recent years.

**Table 27** Acreage and output of peas and beans for human consumption in the United Kingdom/'000 acres and '000 tons/annual averages

	1956/7-58/9	1961/2-63/4	1964/5-66/7	1967/8
<i>Acreage</i>				
Peas	175	131	138	152
Beans	22	26	28	29
<b>Total</b>	<b>197</b>	<b>157</b>	<b>166</b>	<b>181</b>
<i>Output</i>				
Peas harvested dry	43(a)	27	38	58(b)
Peas green for market	72	92	58	61
Peas for canning and freezing	68	126	156	176(c)
Beans	78	92	105	129

(a) Output in 1958 abnormally low; average for 1956/7 and 1957/8 52,000 tons

(b) Includes some 9,000 tons of vining peas which over-matured and were harvested dry

(c) Excludes output from acreage left for harvesting dry

*Peas for harvesting dry*

170 Acreages of peas for harvesting dry have now started to rise after falling sharply in the 1950s. Home output averaged nearly 40,000 tons in the three years to 1966/7 and in 1967/8 rose to about 50,000 tons (after deduction of vining peas which were held over and harvested dry). Imports of blue and green peas continued to decline and in 1967 were less than home output for the first time in recent years. At 44,000 tons they cost £3.4m.

171 The home crop is valuable as a break crop, with useful gross margins; it has the further advantage that the capital equipment involved is little more than that used for cereals. New varieties have been evolved in recent years and new husbandry techniques developed. Yields have risen as a result; they averaged 26 cwt an acre in the three years to 1966/7, compared with an average of 20 cwt five years earlier. The group envisages a further modest improvement to 28 cwt an acre by 1972/3. There would therefore be the basis for a substantially higher

Table 28 Acreage and new supplies of peas for harvesting dry in the United Kingdom/'000 acres and '000 tons/annual averages

	1956/7-58/9	1961/2-63/4	1964/5-66/7	1967/8
<i>Home</i>				
Acreage	85	28	34	47(b)
Output	43(a)	27	38	58(b)
<i>Imported</i>				
Blue and green	50	60	52	44
Other dry	21	14	14	15
Total new supplies	114	101	104	117

(a) Output in 1958 abnormally low; average of 1956 and 1957 52,000 tons

(b) Includes some 7,000 acres, say 9,000 tons, of vining peas harvested dry in 1967

acreage to be grown, provided the demand was available for home produced varieties.

172 As well as being packeted for direct sale, peas harvested dry are used as raw material for canned processed peas, production of which is fairly constant at about 175,000-200,000 tons, wet basis, a year. The main reason for imports is the refusal of certain manufacturers of canned processed peas to depend entirely on the home crop for their supplies. The group can see no convincing reason for these manufacturers to make a practice of importing part of their supplies, especially as imported peas are no cheaper than home grown supplies. Demand for canned processed peas is expected to remain steady, but some fall in demand for packeted dried peas is expected by 1972/3. Any expansion of the acreage of this useful break crop is, therefore, dependent on the replacement of imported supplies. Imports of dried blue and green peas in 1967 were equivalent to the output from about 34,000 acres; if the whole of these imports were replaced by home production, the United Kingdom acreage devoted to dried peas, after taking account of improved yields, would rise to about 70,000 acres.

#### *Peas for freezing*

173 Peas are the largest individual component of the frozen vegetable market, but the acreage grown for freezing is not known. (The official statistics combine the freezing and canning acreages.) The combined total has risen from an average of 56,000 acres over the three years 1956/7-58/9 to an average of 86,000 acres over 1964/5-66/7 and to 88,000 acres in 1967/8. Home output and imports of frozen peas during the last few years are shown below; the 1967 production of 82,000 tons accounted for nearly two-thirds of the total production of frozen vegetables.

174 It is a matter for concern, as with dried peas, that so large a part of the market for frozen peas is supplied by imports; though they fluctuate, they show no sign of falling, costing on average £2m a year and as much as £3m in 1967. There is no question about the home grower's ability to supply the whole of domestic requirements. Imports have occurred for three main reasons. Firstly, one international company which sells on the British market did not freeze in this country. Secondly, the crop matures very rapidly in some years, as

**Table 29 New supplies of frozen peas in the United Kingdom/'000 tons**

	1962	1963	1964	1965	1966	1967
Home production	56.4	47.5	54.9	50.5	61.0	82.1
Imports	11.0	16.7	14.3	12.8	16.4	22.8
Total new supplies	67.4	64.2	69.2	63.3	77.5	104.9

in 1967, and at times exceeds the capacity of the freezers to handle it. Thirdly, imports may arise if freezers underestimate the needs of the market, either in acreage contracted or in weight of peas frozen. Although freezers in Britain prefer to use home grown peas so that they can exercise close control over production and harvesting, extra plant will be put in only if there is a reasonable certainty that there will be a market for the whole of the new capacity throughout the year. It is hoped that recent changes in the structure of the freezing industry will lead to a reduction in these imports.

175 Trade estimates presented to the group suggest an increase of 20 per cent over the 1966 demand for frozen peas by 1972/3, *ie* to rather more than 90,000 tons. If the whole of this increase were met by home produced peas, the extra requirement would be about 15,000 tons; if imports could be eliminated the figure would rise to 30,000 tons. Assuming only a modest improvement in yield to 41 cwt an acre by 1972/3, and no change in demand for peas for canning, an increase of only 7,000 acres on the 1966 acreage of 87,000 would be sufficient to provide the 15,000 tons envisaged to meet extra demand for freezing. A further 9,000 acres would provide enough additional peas to eliminate most imports of frozen peas.

#### *Garden peas for canning*

176 Whether the increased demand for frozen peas will reduce the output of canned fresh peas is uncertain. This has not been the case hitherto, as the following figures of production of canned peas show:—

**Table 30 Production of canned garden peas in the United Kingdom/'000 tons net can content**

	1962	1963	1964	1965	1966	1967
	64.8	81.5	87.3	73.8	89.3	90.5

The group assumes that there will be no growth in this market. There are virtually no imports which might be displaced by higher home output.

#### *Peas for market*

177 Further decline in the sale of these peas is almost inevitable as they suffer most from the growth in the popularity of frozen peas and other convenience foods. The acreage dropped by half in four years, from 30,000 acres in 1962 to only 15,000 acres in June 1966, and the volume of production fell correspondingly, though there was some recovery in 1967. The group assumes a further fall of 5,000 acres by 1972/3. There are no imports.



**Table 31** Acreage and output of peas for market/'000 acres and '000 tons/  
annual averages

	1956/7-58/9	1961/2-63/4	1964/5-66/7	1967/8
Acreage	34	28	18	18
Output	72	92	58	61

*Conclusion on peas*

178 The British farmer is capable of growing enough peas to meet the whole of the demand for all those types of peas for human consumption that are suitable for cultivation in Britain. Self-sufficiency in *peas harvested dry* depends on the manufacturers of canned processed peas abandoning their traditional reliance on imports for part of their supplies, and we see no good reason why this should not be done. Some 30,000 additional acres would be required to replace imports of blue and green dried peas.

179 Replacing imports of *frozen peas* is dependent on the provision of sufficient freezing capacity, and the group believes the food processing industry should be encouraged to provide greater capacity so as to make maximum use both of peas and of other home grown vegetables and fruit. Some 16,000 additional acres of peas would be required, of which about 5,000 would be at the expense of peas for market, by 1972.

180 For such an expansion, the cost of additional combines would be negligible, but it is estimated that pea cutters would be required on half the additional acreage of peas harvested dry at a cost of £120,000; depreciated over seven years the annual cost would be under £20,000. The net additional 11,000 acres of vining peas would require additional viners at a cost of £400,000; depreciated over seven years the annual cost would be £60,000. Variable costs would be about £600,000 a year, of which over half would be for seed, and the remainder mainly for sprays (£120,000) and fertilisers (£90,000). No additional labour would be required.

181 The import saving that would result from the group's proposals would total £5½m, £3½m from replacing imports of peas harvested dry and £2m from replacing imported frozen peas. (The group believes that the £3m worth of frozen peas imported in 1967 was exceptionally high, and that £2m represents a more normal figure.) The import content of inputs used in growing the additional peas would be very small.

*Beans*

182 The acreage of green beans for human consumption, under 30,000 acres is approximately only one-fifth of the pea acreage. French and runner beans have increased in acreage whilst broad beans have tended to decline—85,000 tons of runner and French beans were sold in 1967/8 compared with 59,000 tons in 1963/4, while output of broad beans fell to 33,000 tons in 1966/7 compared with 47,000 tons in 1963/4, though there was some recovery to 44,000 tons in 1967/8. No details are available of the acreage of beans grown for processing.

183 Although imports of frozen beans are valued at £1m or less, they represent a significant, if declining, share of total supplies of frozen beans (20 per cent in 1967). This outlet for home grown beans trebled between 1962 and 1967, and the trade envisage a further significant expansion by 1972/3. Canned green beans are a smaller outlet than the frozen market and sales are not expected to change

greatly by 1972/3; but there could be a useful increase in the market for packeted green beans. The following table summarizes the market in frozen and canned beans.

**Table 32** New supplies of frozen and canned beans in the United Kingdom/  
'000 tons

	1962	1963	1964	1965	1966	1967
<i>Frozen</i>						
Runner and French (home grown)	7.7	11.9	13.9	12.5	17.2	23.3
Broad beans (home grown)	2.5	2.4	1.7	1.9	1.4	2.0
Imported (all beans)	5.3	1.8	4.9	2.7	6.0	6.3
<i>Canned</i>						
Runner and French	4.1	6.9	11.4	6.5	7.6	11.8
Broad	13.3	12.4	14.4	13.3	9.6	10.7

*Conclusion on beans*

184 Import saving depends mainly on the availability of additional freezing capacity. Home growers, given the opportunity, could supply the whole of the market. Only 2,000 acres would be required to replace the 1967 level of imports, and additional resources required would be negligible. The import saving would approach £1m a year.

**Beans for stockfeed**

*Relative importance*

185 There has been a considerable expansion in the acreage of beans for stockfeed in the last three years, stimulated by the problems encountered in the growing of wheat. Acreage in 1967/8 exceeded 140,000 compared with about 100,000 acres in 1966/7 and 85,000 acres in 1965/6. A further expansion is expected in 1968/9, when growers will have the benefit for the first time of a £5 an acre grant. With a yield of 24 cwt an acre, output in 1967/8 is estimated at 170,000 tons, and is likely to be substantially higher in 1968/9.

**Table 33** Acreage and production of beans for stockfeed in the United Kingdom/  
'000 acres and '000 tons/annual averages

	1956/7-58/9	1961/2-63/4	1964/5-66/7	1967/8
Acreage	95	65(a)	85(a)	144
Production	81	67(a)	96(a)	170

(a) Including peas grown for stockfeed, if any

*Disposal of the crop*

186 Except for experimental purposes, British animal feed compounders have made little or no use of this crop. Apart from requirements for seed and for

feeding to pigeons, the crop is used either on farms in home mixed feeds or, increasingly, it is exported. This export trade began in 1965, the main users being compounders in Holland and Germany, but supplies are also sent to several other European countries. The group received evidence that, of the 170,000 tons produced in 1967/8, at least 80,000 tons, worth about £2½m, were exported. Of the remainder, about 40,000 tons went for seed and for pigeon feed, leaving some 50,000 tons for animal feed, including the small quantity taken by compounders.

#### *Prospects for expansion*

187 The group was told that the reason beans had hitherto been little used by British compounders was because the price which Continental compounders were able to pay for this raw material, in competition with cereals and other ingredients at continental price levels, was higher than British compounders could pay in relation to alternative sources of starch and protein, etc, in Britain. There is, however, no technical barrier to the use of beans by the British compounding industry. Whilst its great value as a break crop and its current gross margin of £30 an acre (including the £5 acreage payment) clearly show the importance to British farmers of developing the market for this crop to the maximum extent, the group has found it difficult to postulate a desirable level of production in 1972 because of the inexperience of British compounders in handling this crop and because of the apparent lack of any specific plans for using more of this commodity in compound feeds. The group felt that compounders should be advised to prepare for the large scale availability of beans in the near future. The area down to beans could well reach 500,000 acres by 1972 and, despite the current attraction of the export market for beans, the group took the view that in the long term the main market would be at home rather than abroad.

188 In the light of these various considerations, the group decided to postulate a probable acreage of 400,000 acres for 1972/3; with a yield of about 27 cwt an acre, production from this acreage would total 540,000 tons. At least in the short run to 1972/3, the group believes there to be a good prospect that the export market will still take a substantial part of the production. Assuming that exports amounted to 120,000 tons, and 55,000 tons were required for seed and pigeon feed, 365,000 tons would be left for the home market. If demand for farm mixing did not rise above the present level, the quantity remaining for compounders to handle would be rather more than 300,000 tons. The group believes that this quantity could easily take the place of imported feedingstuffs, and that any problems in disposing of the additional quantities on the home market would be capable of solution.

#### *Cost in resources*

189 As expansion of the bean acreage would tend to be in the predominantly arable areas, no extra combines or drying capacity would be required, but to achieve a regular pattern of marketings there would be a need for additional storage capacity. If additional storage were provided for one-third of the crop the cost would be about £1.0m or £0.07m a year depreciated. Annual variable costs would be about £16 an acre, totalling £4½m a year, of which seed would account for nearly £1½m, sprays for £1½m and fertilisers £1m.

#### *Import saving*

190 After allowing for seed, the additional production over 1967 would amount to 345,000 tons. For the purpose of calculating the import saving, the

group made the simplifying assumption that each ton of beans would replace  $\frac{1}{2}$  ton of imported cereal and  $\frac{1}{2}$  ton of imported soya bean meal. Taking cereals at £24 a ton and soya bean meal at £50 a ton, the gross import saving would be £12½m a year. Imported inputs—in fertilisers and fuel—would not reduce the import saving significantly, nor would the contribution to the balance of payments be very different if the beans were exported rather than used at home.

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## Oilseed rape

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### *Relative importance*

191 As well as providing a useful source of edible oil, oilseed rape is important because of its value as a break crop. It grows well on chalk soils, which are unsuitable for some other break crops, and results in unusually large increases in yields of succeeding grain crops. Moreover it fits into existing arable farming systems, thus requiring little, if any, extra capital or equipment. If it could provide an acceptable gross margin—at the moment it is up to £20 an acre for spring rapeseed and up to £25 an acre for winter rapeseed—it would be an attractive crop in the current search for break crops to reduce the losses associated with continuous cereal growing.

192 In recent years some 4,000–5,000 acres of rape have been grown for oilseed, but there was a sharp increase in 1967 when an estimated 20,000 acres were grown. Yields are currently averaging 15 cwt an acre, but it is thought an average yield of 18 cwt is feasible by 1972/3 which, in current circumstances, would give a more acceptable gross margin. There are some agronomic problems associated with the growing of rapeseed—pigeon damage, harvesting difficulties, lack of suitable herbicides—but these are not insuperable. The main impediment to a relatively high increase in the acreage of rapeseed, to match the scale of production of some other European countries, is the low financial return due to competing oilseeds.

### *Market*

193 Rapeseed oil has to take its place in the overall market for edible oils. Total imports of animal and vegetable oils and fats amount to about £63m a year and additional quantities are obtained from the crushing of imported oilseeds. The growing of oilseed rape in Britain represents the only possibility of replacing some of these imports, as it is suitable for growing in a wide range of temperate climates; hence the crop is widely grown in Europe and N America. Imports of rapeseed oil are negligible but imports of seed for crushing rose rapidly in 1965 and 1966 to reach 42,000 tons, and were little changed in 1967 at 40,000 tons costing £1.8m. Poland was the main supplier in 1967, with smaller quantities from Canada, E Germany, Holland, Sweden and France. No duty is charged on these imports, and those of European origin were sold at highly subsidised prices.

194 Margarine manufacture is the main outlet for rapeseed oil; small quantities are used in the manufacture of cooking fats, shortenings and salad oil and there is also a small industrial use. It is estimated that some 16,000–18,000 tons were used in liquid form for edible purposes in 1966. As a liquid oil, rapeseed oil currently realises £75 a ton, but margarine manufacturers are not prepared to use more than 10 per cent of rapeseed oil in their formulations and the present proportion is probably less than 5 per cent. The use of rapeseed oil as a liquid oil is limited, partly because it has a low *linoleic* acid content, to which importance

**Table 34 Imports of rapeseed, rapeseed oil and rapeseed cake into the United Kingdom**

	<i>Rapeseed</i>		<i>Rapeseed oil</i>		<i>Rapeseed cake</i>	
	'000 tons	£m	'000 tons	£m	'000 tons	£m
1962	7.2	0.3	n.a.	n.a.	49.0	1.2
1963	7.9	0.3	3.7	0.3	29.4	0.7
1964	11.5	0.5	0.2	*	35.7	0.9
1965	32.1	1.5	0.3	*	54.5	1.5
1966	42.2	2.0	*	*	85.8	2.1
1967	40.0	1.8	*	*	75.5	2.0

\* Less than 50,000 tons or £50,000

is attached on health grounds, but also because of its high *linolenic* acid content, which makes it liable to develop off-flavours in the product unless hydrogenised. The maximum market which could be envisaged for rapeseed oil as a liquid oil is about 25,000 tons a year.

195 As a hardened (hydrogenised) oil, rapeseed oil has to compete with other hardened oils and would be valued at about £1 a ton more than fish oil, *ie* currently at the unusually low level of about £36 a ton. Taking into account the residual value of the meal, this is equivalent to an ex-farm price of about £25 a ton for rapeseed, compared with the current ex-farm price of £40 a ton. There is no doubt that margarine manufacturers could use larger quantities of hardened rapeseed oil at these low prices, but production of oilseed rape clearly would be uneconomic.

196 The market for rapeseed meal is also limited. Only one animal feed compounder appears willing to make much use of this ingredient and a general impediment to wider use is the fact that poultry rations, which account for nearly half the output of compounds, can contain no more than 5 per cent of rapeseed meal. Nevertheless, finding a market for more home produced meal would not be difficult; United Kingdom consumption in 1966 is said to have been 115,000 tons, of which 88,000 tons were imported, valued at about £2m. This amount of meal would require about 150,000 tons of seed, the produce of some 160,000 acres at estimated 1972/3 levels of yields.

#### *Prospects for expansion*

197 The group concludes that it would not be economic to develop the production of oilseed rape to compete with the currently low-priced hardened oils. Nevertheless, the value of the crop in terms of higher cereal yields justifies the group in recommending that enough seed should be grown to provide the whole of the current consumption of this oil in liquid form. At present, imports provide about 16,500 tons of oil and home production about 8,000 tons. The acreage target for 1972/3 should thus be 65,000 acres, yielding 60,000 tons of seed and about 25,000 tons of oil. As this crop is relatively unfamiliar in Britain, returns a low gross margin, and is subject to the uncertainties of the international oil market—which is currently weak—a price incentive giving an assurance of higher gross margin would be required to achieve this acreage. Set against the prospects of further expansion in field beans, the risk of over-expansion of oilseed

rape is small. Moreover, if means were found to use a higher proportion of rapeseed oil in margarine manufacture and other food processing without lowering prices, a higher output target could be adopted.

#### *Cost in resources*

198 Existing combine and drying capacity is thought to be adequate for this crop. Crushing capacity is currently available, so that no capital charges would arise beyond the farmgate. Annual variable costs, at £11 an acre, would amount to about £500,000.

#### *Import saving*

199 The assumed yield of 60,000 tons of seed represents an increase of about 45,000 tons on the 1967 output. After allowing for seed requirements, the import saving, at £44 a ton, would be about £1½m.

#### *Conclusion*

200 In the view of the group there is a case for encouraging the growing of oilseed rape on a moderate scale. Devaluation has strengthened the case by raising the price of imported rapeseed. The decision whether or not to stimulate the crop needs to be made by the Government as a matter of urgency since, without the assurance of a better gross margin, the acreage is likely to fall away again.

### **Herbage and brassica seed**

#### *Relative importance*

201 The value of output of home produced herbage seeds at farmgate prices is now about £2½m annually, of which clover accounts for nearly £1m. Thus herbage seeds in terms of their value do not make a significant contribution to the output of the arable sector, though the quality of the fodder they produce is of considerable importance to livestock production. The value of imports during 1966/7 was £2·6m.

202 Brassica seed production exceeds the needs of the home market, except for cauliflower and broccoli, and there are exports, as well as small imports which were under £100,000 in 1965/6. The value of output is about £½m.

#### *Herbage seeds*

203 Home production of herbage seed gives rise to some concern. Though never likely to be a major crop, herbage seeds provide a useful break from cereal production, and little, if any, specialised machinery is necessary on the arable farm. A modest contribution to import saving would result from an extension of the acreage in Britain, which for certified seed alone has fallen from 55,000 to 35,000 acres in the last few years. The first consideration, however, is the quality of seed available to British farms. Not all home produced seed is yet certified or of the best quality, but there are dangers for home users if they have to depend too heavily on imported supplies, which are subject to only a limited quality control and which contain some indifferent quality seed. A sizeable home market is also necessary if progress in breeding new varieties is to be maintained.

204 Although imports of clover seed are small in relation to total imports of herbage seed (valued at £340,000 in 1966/7) there is a risk that the wide fluctua-

tions in prices which arise from the fluctuations in output may result in British producers no longer growing this crop, and thus lead to much heavier imports. The group would welcome any steps which could be taken to bring stability to the market for clover seeds.

205 Within the total imports of £2½m-£2¾m, some £½m consists of amenity grasses, for making lawns, parks and sports grounds, *etc.* Imports supply practically the whole of the demand for these varieties, with Canada, the United States, Denmark and Holland as the main suppliers.

206 The group believes that the home industry could make a useful contribution by 1972/3 towards reducing imports, particularly of ryegrass and perhaps of other species, not excluding those used for amenity purposes.

207 The group welcomes the setting up by the Ministry of Agriculture, Fisheries and Food of a Committee on Herbage Seeds Supplies, and hopes that its recommendations will give confidence to the industry and enable it to produce a larger proportion of the supplies required for the British market. The additional acreage required is likely to be up to 20,000 acres and little in the way of additional resources would be needed. The gross import saving could be about £1m a year.

#### *Brassica seeds*

208 The situation for brassica seed—with a net export surplus—appears reasonably satisfactory.

Annex 1 Costs of resources required for arable expansion/£ million

	Fixed capital		Annual variable physical inputs						Total annual capital and variable physical inputs	
	Total 1967-72	Annual depreciation	Seed	Fertilisers(a)	Sprays	Fuel and power	Machinery repairs	Total		
Cereals	36.0	3.3	4.9	13.5	1.6	3.4	1.7	25.1	28.4	
Sugar beet(b)	—(c)	—	0.2	0.9	0.2	0.1	0.1	1.5	1.5	
Peas and beans for human consumption	0.3	0.05	0.28	0.07	0.10	0.07	—	0.52	0.6	
Beans for stockfeed	1.0	0.07	1.38	1.00	1.30	0.39	0.26	4.33	4.4	
Rapeseed	—	—	0.14	0.24	0.05	0.05	0.05	0.53	0.5	
Herbage and brassica seeds	—	—	0.02	0.13	—	0.02	0.02	0.19	0.2	
Lime	6.0	1.20							1.2	
Drainage	5.0	0.25							0.2	
<b>Total</b>	<b>48.3</b>	<b>4.9</b>	<b>6.9</b>	<b>15.8</b>	<b>3.3</b>	<b>4.0</b>	<b>2.1</b>	<b>32.1</b>	<b>37.0</b>	

(a) Before deduction of subsidy and post devaluation

(b) After 1974

(c) Excludes capital cost of sugar beet factory (£11m) after 1972/3



Annex 2 Basis of estimate of cost of resources for proposed arable expansion

Acreage	Fixed capital costs 1967-72—£m(a)		Annual variable physical inputs—£ per acre						Total variable costs—£m
	Buildings	Field machinery	Fertilisers (b)	Seed	Sprays	Fuel and power	Machinery repairs	Total	
Wheat	extra 1.0m existing	24	5.5	3.1	1.0	2.0	1.0	12.6	12.6
Barley	extra 0.5m existing		0.63			0.02			1.5
Oats	extra 0.5m existing		5.5	2.2	0.8	2.0	1.0	11.5	5.8
	extra 0.2m existing		0.38			0.03			2.6
Sugar beet	extra 45,000(c) existing	(d)	4.1	3.4	0.8	2.0	1.0	11.3	2.3
			0.31						0.3
			14.4	4.0(e)	4.0	3.0	2.0	25.4	1.2
Peas			0.67						0.3
harvested dry	extra 30,000								
Vining peas	extra 5,000	—	1.6	7.0	2.7	2.0	—	13.3	0.4
Beans for		—	4.0	13.0	4.0	2.0	—	23.0	0.1
stockfeed	extra 260,000	1.0	3.8	5.3	5.0	1.5	1.0	16.6	4.3
Rapeseed	extra 45,000	—	5.4	3.0	1.0	1.0	1.0	11.4	0.5
Herbage seeds	extra 20,000	—							0.2
Total of above	25	12							32.1(f)
Drainage		5							
Lime		6							
Total		48							32

(a) See notes on estimate of capital costs below

(b) Before deduction of subsidy and post devaluation

(c) After 1974

(d) Excludes capital cost of sugar beet factory after 1972/3

(e) Assuming genetic monogerm seed

(f) No allowance made for fall of 74,000 acres in potatoes by 1972/3, saving £3.7m in variable costs

The assumptions made in the estimates of the capital costs for cereals expansion were as follows:

#### Storage capacity

70 per cent of extra production required to be stored at peak *ie* 2.5m tons at average cost of £8 per ton, totalling £20m. Annual depreciation, over 15 years, £1.3m per year.

#### Drying capacity

<sup>1</sup>	<i>New acreage</i>	<i>Extra acres</i>	<i>Percentage extra tonnage requiring additional drying capacity (at £3 per ton)</i>	<i>Total cost £m</i>
	Predominantly cereal areas	300,000	20	0.3
	Predominantly mixed farming areas	700,000	50	1.7
	Predominantly livestock areas	700,000	50	1.7
				3.7
2	<i>Existing acreage</i>	Allowance for part of extra tonnage		0.7
				4.4
				Total

Annual depreciation, over 10 years, £0.4m per year.

#### Combines

On the basis of 70 per cent of expansion in predominantly cereal growing areas being handled by the present number of combines and declining to only 50 per cent of the expansion in predominantly livestock areas, total cost would be £9.2m. Annual depreciation, over seven years, £1.3m per year.

#### Other field machinery

All other field machinery at £2 per acre would total £3m. Annual depreciation over 10 years £0.3m per year.

## 2 The livestock sector

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### Cattle

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#### Introduction

##### *Relative importance*

209 Cattle and their products account for over half the value (including deficiency payments) of farm sales of livestock and livestock products, and nearly two-fifths of total farm sales. In the three years to 1967/8, cattle contributed £709m a year, on average, out of the total annual value of farm sales of £1,873m; dairy cattle provided £424m in the form of milk and milk products, as well as making a significant contribution to the £285m of fat cattle and calves.

##### *Balance of home production and imports*

210 Government policy under the selective expansion programme is to increase beef production to the full extent of the technical possibilities by 1970. An undertaking was given that, provided there was no significant change in circumstances, the Government would not reduce during the period of the selective expansion programme either the guaranteed price for fat cattle or the rate of beef cow subsidy as determined at the 1966 Annual Review. It was further recognised that an increase in the dairy herd would be required as part of the programme for expanding beef production to the full extent of the technical possibilities. This would entail an expansion in milk production which would meet the growing consumption of liquid milk and cream and a substantial part of the additional requirement of milk products. The Government gave an assurance that they would take account at future Reviews of any depression of the pool price that resulted from extra milk produced in the course of expanding the dairy herd to meet the need for increased beef production.

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**Table 35 Production and net imports of milk and milk products in the United Kingdom/million gallons equivalent**

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	1962	1963	1964	1965	1966	1967
<i>Home production*</i>						
Liquid consumption	1606	1622	1641	1643	1650	1660
Manufacture	853	766	698	794	763	838
Net imports	2533	2576	2858	2724	2737	3002
Total	4922	4964	5197	5161	5150	5500
<i>Home production as per cent of total</i>						
	49	48	45	47	47	46

Source: Milk Marketing Board

\* Sales through milk marketing schemes

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211 Home production of milk accounts for under half the total United Kingdom demand for milk and milk products. Excluding milk used on farms, the home industry supplied only 46 per cent of the commercial market for milk and milk products in 1967 and this proportion has been tending to decline. The home industry supplied all the demand for liquid milk and nearly all that for fresh cream, but less than one-tenth of the market for butter. In terms of milk equivalent, butter accounts for almost half the total demand for milk and milk products in Britain.

212 The total value of imports of dairy products in 1967 was £203m. The two most important imports were butter, which cost £147m, and cheese, costing £43m. In comparison, exports of dairy produce were small, worth only about £10m.

**Table 36 Supplies of beef and veal in the United Kingdom/'000 tons**

	1962	1963	1964	1965	1966	1967
Home-bred slaughter	754	770	685	670	718	749
Irish stores(a)	116	141	161	115	109	154
Live exports(a)	29	41	75	80	41	64
<b>Total home-fed output</b>	<b>899</b>	<b>952</b>	<b>921</b>	<b>865</b>	<b>868</b>	<b>967</b>
Carcase meat imports	328	358	345	290	286	269
Irish fat cattle(a)	34	18	16	18	27	5
<b>Total imports (excl. Irish stores)</b>	<b>362</b>	<b>376</b>	<b>361</b>	<b>308</b>	<b>313</b>	<b>274</b>
Total available supplies	1,261	1,328	1,282	1,173	1,181	1,241
Exports and re-exports(b)	29	44	86	92	48	70
<b>Retained supplies</b>	<b>1,232</b>	<b>1,284</b>	<b>1,196</b>	<b>1,081</b>	<b>1,133</b>	<b>1,171</b>

(a) Estimated carcase weight at slaughter

(b) Including small quantities of carcase meat, figures for which are not known for 1962

213 Total supplies of beef and veal available in the United Kingdom, including quantities exported, are shown in Table 36. They amounted to almost 1,200,000 tons a year on average during the three years 1965-7. Of this quantity, 70,000 tons a year were exported, mainly as live animals but including a little carcase meat, so that supplies retained for the domestic market totalled about 1,130,000 tons a year. Home production accounted for 900,000 tons a year on average in 1965-7. It should be noted, however, that a substantial proportion of home produced beef—estimated at about 125,000 tons a year in 1965-7—is derived from store cattle imported from the Irish Republic and fattened in this country. In 1967, the Irish Republic's shipments of store cattle were particularly high and cost £41m.

214 Imports of carcase meat in 1965-7 amounted on average to 282,000 tons a year and were supplemented by a relatively small and fluctuating supply of fat cattle from the Irish Republic. The carcase meat equivalent of these imports averaged 17,000 tons a year, bringing total imports up to almost 300,000 tons a

year. This total quantity represented 25 per cent of the total available supplies of beef and veal. The cost of imports of all forms of beef and veal, including Irish stores and fat cattle, amounted to £109m in 1967.

#### *Future demand*

215 The demand working group calculated that, at unchanged 1966 price relationships, demand for milk and milk products would rise by 6.6 per cent between 1966 and 1972. This is the equivalent of 340m gallons of milk and would bring total demand to the equivalent of some 5490m gallons by 1972. Some 90m of the increased gallons would be for liquid milk, 60m gallons for cream and 190m gallons for other milk products.

216 The demand group suggested that domestic demand for beef and veal would grow by about 50,000 tons above the 1966 level by 1972. Assuming no significant change in exports, total demand in 1972 would thus rise to about 1,190,000 tons. While the projected increase in demand is modest—equivalent to only about 200,000 head of fat cattle a year—there is, nevertheless, ample scope for import replacement. Moreover it is possible that world supplies, which tend to vary cyclically, might be relatively tight in relation to world demand in the early 1970s.

**Table 37 Cattle population in the United Kingdom/June—million**

	1962	1963	1964	1965	1966	1967
Dairy cows	3.29	3.25	3.14	3.19	3.16	3.21
Beef cows	0.98	1.01	0.98	1.02	1.11	1.14
Heifers in calf with first calf	0.80	0.74	0.80	0.76	0.75	0.82
Total cattle and calves	11.86	11.72	11.63	11.96	12.21	12.34

217 The total number of cows has been virtually static in recent years; from 1962 to 1967 numbers increased by only 80,000, from 4.27m to 4.35m. This increase was the net result of a modest rise of 160,000 (16 per cent) in beef cow numbers partly offset by a fall of 80,000 in dairy cow numbers. By June 1967, beef cows accounted for 26 per cent of the total cow numbers, compared with 23 per cent in 1962. Output of home-fed beef—which reflects changes in the number of calves retained for fattening and imports of Irish store cattle as well as changes in the number of beef cows—went up by only 7 per cent. Milk production was at a peak of 2,459 million gallons in 1962 and this was not equalled or exceeded until 1967, when favourable weather conditions resulted in a total output of 2,498 million gallons, even though cow numbers were slightly less than in 1962.

#### **Prospects for expansion**

##### *Dairy cow numbers*

218 There is no doubt that a substantial increase in dairy cow numbers is technically possible, for the number of replacement females in the pipeline aged 1 to 2 years is over 75 per cent larger than the number of heifers actually in calf and about to take their place in the milking herd. While the practice is well established of diverting a substantial number of second-line replacements to

slaughter instead of allowing them to enter the milking herd, there can be no doubt that a fair proportion of these young females are of dairy type. Thus the availability of young stock is not a factor limiting the size of the dairy herd; such an increase depends on both the absolute level of profitability of milk production and the relative attraction of milk production to beef production.

219 The maximum rate of increase in the number of dairy cows in recent years was 80,000 a year, a rate sustained over the three years 1959 to 1962. This was a shorter period than that now being considered and, in any event, was not typical because of the tuberculosis eradication scheme in the years immediately before 1959. With brucellosis eradication on the way and the losses from foot and mouth disease to replace, such a rate of increase is unlikely to take place between 1967 and 1972; the group believes that within the present technical and economic pattern of agriculture, an average increase of some 60,000 cows a year or 300,000 over the period as a whole is more realistic, given an appropriate balance between the prices of cull cows and milking stock. The number of dairy cows would thus total some 3.51 million in June 1972. To obtain the cheapest milk production and to maximise import saving, the majority of the additional cows should be late winter/early spring calvers, and to achieve this calving pattern there would be need for some adjustment of the seasonal schedule of milk prices. To increase the national herd much more rapidly would require milk production to be sufficiently profitable for a sufficiently long period to attract substantial new resources into the industry.

#### *Milk yields*

220 Evidence provided by the Milk Marketing Board suggested that average yields per cow are still increasing, but at a declining rate; the current average figure of about 7 extra gallons a year is likely to drop to 5 gallons or even less by 1972/3. An important reason for the decline in the rate of improvement is the lessening impact of breed changes; the Friesian breed continues to progress, now at the expense of the Ayrshire breed rather than the Shorthorn, but the rate of change is slower and the subsequent improvement in yield is smaller. The group decided to postulate a total improvement of 25 to 30 gallons in sales of milk a cow, from 762 gallons in 1966/7 to about 790 gallons in 1972/3.

#### *Total output of milk*

221 On the basis of an increase in cow numbers of 300,000 and an improvement in yield as envisaged above, sales off farms would increase from 2,498 million gallons in the calendar year 1967 to about 2,780 million gallons in 1972/3, an increase of 282 million gallons or 11 per cent. If the 1972/3 season were as favourable for dairying as was 1967, the increase in milk production would be substantially higher than 282 million gallons.

#### *Beef from the dairy herd*

222 The group has assumed that, given the postulated expansion of 300,000 dairy cows by 1972, 230,000 calves would be retained each year of which 60,000 would be required as herd replacements, leaving 170,000 calves for fattening for beef. Ignoring any losses, these calves would produce 42,500 tons of beef a year. Moreover, the additional dairy cows would ultimately add to beef supplies when they were culled; assuming 60,000 extra cows a year were culled, and after allowing for losses of 2½ per cent, a further 16,500 tons of beef would be expected from this source. Thus the assumed expansion in dairy cow numbers would result eventually in a total of 59,000 tons of additional home-produced beef each year.

223 There are also possibilities of obtaining more beef from the dairy herd by retaining more calves for fattening; it is often claimed the calves which are now slaughtered would provide an easily exploited source of additional beef. In practice, the number slaughtered in any particular year appears to be influenced mainly by the state of the market for beef; it is the level of market prices, rather than the guaranteed price, which often determines whether a calf will be reared or slaughtered. In 1965, a year of high fatstock prices, the number of calves slaughtered fell to the very low level of 381,000, but with weaker markets the figure rose to 614,000 by 1967. Subsequent experience has shown that some of the additional calves retained in 1965 were uneconomic to rear and fatten, and some did not satisfy the minimum standards of eligibility for guarantee payments. (There is the possibility, however, that these standards are not wholly in line with market requirements in certain areas.) It must be concluded, therefore, that under present conditions the proportion of calves retained in 1965 was unduly high, and should not be expected to recur except at times of high market prices. At the same time, the 1967 level of slaughterings was higher than it needed to be, and the group estimates that, given suitable conditions, an additional 140,000 calves a year from the dairy herd could be fattened by 1972/3. The calves would produce some 35,000 tons of beef, instead of about 3,000 tons of veal. Hopes of a still further increase in beef supplies from higher calf retentions are dependent on the use of better types of sire, improved management, changes in grading standards, and, perhaps, on further changes in the breed of dairy cow.

224 The total additional production of beef eventually obtainable from the dairy herd would be 94,000 tons—59,000 tons from the effects of expanding cow numbers, and 35,000 tons from higher calf retentions. There would, however, be a loss of 3,000 tons of veal.

#### *Beef cow numbers*

225 Considered from the biological viewpoint, it would be comparatively easy to increase the size of the beef breeding herd. Substantial numbers of heifers are slaughtered each year; many of these will be beef crosses, and suckler cow numbers could be stepped up substantially by retaining more heifers for breeding though at the cost of a temporary fall in the supply of beef. After considering the trends in beef cow numbers in recent years, however, and noting that the biggest increases over three-year periods (between 1960 and 1963 and between 1964 and 1967) were about 55,000 cows a year, the group decided it would not be prudent to postulate a continuing increase of more than 60,000 cows a year over a five-year period even if favourable conditions obtained. This rate of expansion would raise the beef cow herd to 1.44m by 1972. The group assumed that, following the present pattern, half the additional cows would be in the hill areas, calving in the spring, with half their calves finished in 18 months and half in 24 months. Of the other half—cows in lowland beef herds—it has been assumed that half of their calves would be intensively finished over winter to 15–18 months, and half finished on grass at 21–24 months.

226 The 300,000 additional beef cows would, it is assumed, produce 255,000 weaned calves a year, of which 45,000 would be required as herd replacements. Disregarding any losses, which should be small, the remaining 210,000 calves would produce about 52,500 tons of beef a year. Moreover, the additional beef cows would themselves produce extra beef when they were culled from the breeding herd. Assuming some 45,000 a year were culled and perhaps 44,000 of them marketed as beef, the yield would be about 12,000 tons of beef. Thus the

additional beef ultimately obtainable from the expansion of the suckler herd would amount to some 64,500 tons.

#### *Other sources of additional beef*

227 An increase in the supply of beef could be obtained by advancing the date of first calving of heifers entering the breeding herd. It is quite common for heifers not to calve until they are 30 months of age or more, whereas there is no physiological reason why they should not calve by 24 months. As well as bringing forward the supply of beef such an advancement of the age of first calving would make a useful contribution to the efficiency and profitability of beef production.

228 The bred heifer system, if as successful commercially as experimentally, would also appear to provide a useful and rapid supplement to conventional methods of beef production. This technique involves speeding up the sexual maturity of the heifer, by suitable feeding, so that mating can be effected at 12-13 months of age. The resulting calf receives no more than colostrum from its dam and is then reared artificially; the dam is slaughtered once she is dried off, so that she produces a calf and a carcase by the time she is about 24 months old. This system has the attraction of providing a calf with little additional land, as well as providing additional beef more quickly and with less demand on producers' capital resources. Unfortunately insufficient investigation has been undertaken to warrant a firm endorsement of this technique, but the preliminary indications are that it is physically feasible, and that there is no appreciable detriment to the cut-up value of the resulting carcase or to the eating qualities of the meat. If successful, the bred heifer system could enable additional calves to be obtained whilst causing no more than a slight hiatus in beef supplies through the postponement by six months or so of the date of slaughter of the heifer herself. It is possible that, to give easier calving, many of these calves would be Angus crosses, and the current prejudice of the market in certain areas against Angus-cross heifer calves would have to change for full advantage to be taken of the system.

229 The group considered the prospects of obtaining additional beef from the greater prevention of calf losses. Firstly, there are the calves which die in the early weeks of life. Whilst the number of such deaths is not known, the proportion could be over 5 per cent, and if it were reduced a worthwhile increase in beef supplies could be obtained. Moreover, death is only the extreme expression of unthriftiness, more usually expressed as slow maturity and delayed arrival at slaughter weight. The practice of selling calves at an early age is probably a main cause of such losses and setbacks; they could be substantially reduced by better care in the early weeks of life.

#### *Total output of beef*

230 It is not possible to quantify the extra beef that could be obtained from the earlier calving of heifers, better calf rearing, and the bred heifer system, though it should do much more than offset the loss of veal from higher calf retentions. The additional beef that would result from the group's main proposal would be:

	<i>tons</i>
From expanded dairy herd	59,000
From existing dairy herd	35,000
From expanded beef herd	64,500
<b>Total</b>	<b>158,500</b>



For the reasons given in Annex 4, pages 91-94, the increase in production in 1972 over 1967 will be less than shown above.

#### *Conditions for expansion*

231 It is clear that, on biological considerations alone, the availability of animals in recent years could have resulted in dairy and beef herds much larger than those actually in existence. The increase in milk production and associated dairy beef proposed by the group is modest. The additional milk does little more than provide for the extra demand for milk and milk products postulated between 1966 and 1972 (340 million gallons extra demand, 367 million gallons extra supply over the six-year period). The group proposed this degree of expansion in the belief that it was comfortably within the capacity of the industry, provided the producer was not penalised for the extra production. Undoubtedly a much larger expansion could be induced, however, which would result in a useful reduction in the existing level of imports of dairy products. But it could only be obtained at the expense of other grazing livestock or arable enterprises.

232 The proposed increase in beef production from the suckler herd would call for considerable changes in management decisions. The principal factors that have prevented the full exploitation of the biological possibilities for expansion have been insufficient profitability in relation to other enterprises in the lowlands, and, in the hills, production that is often too unrewarding to attract the capital necessary to overcome the natural disadvantages, without which a rapid expansion of the breeding herd is impossible. The uncertainties of autumn store marketing also inhibit such an expansion. Although the Government has given various assurances to the industry, these have not yet generated sufficient confidence to induce the maximum increase technically possible in the size of the beef herd. In fact, the increase of 35,000 cows between 1966 and 1967 was exceeded in four of the preceding six years and equalled in one of the remaining two years. Guaranteed prices for fat cattle and the hill cow subsidy were, however, raised at the 1968 Annual Review. Whilst it is possible that the increase of 300,000 beef cows can be obtained without substantial changes in present support arrangements, it is clear that expansion on such a scale will not come unless there is confidence throughout all sectors of the beef industry that the market will give a more stable and satisfactory return at all stages of production—for calves and stores as well as fatstock. Given such confidence, there will also be a substantial bonus in the form of additional retention of calves from the dairy herd for fattening for beef.

#### **Cost of resources**

##### *General*

233 With the many different systems of housing, milking and fattening cattle only a general indication can be given of the resources required for the expansion of the dairy and beef herds. The advice of experts has differed substantially on the capital costs involved, the differences reflecting in some degree variations in approach to building standards and systems. The group believes it essential if additional milk and beef production is to be economic that expensive forms of housing must be avoided and systems kept as simple as possible. Moreover, the group has noted that the higher estimates of costs were based on contractors' prices, whereas in practice farmers will make as much use as possible of farm labour.

##### *Capital—dairy herd*

234 In assessing the extra capital cost that an increase of 300,000 dairy cows by

1972/3 would entail, it is first necessary to form some impression of the changes in the structure of the dairying industry that are likely to take place by that date without it being given any special encouragement to expand. The average size of herds milked in parlours in England and Wales in 1965/6 was 51 cows, while other herds averaged only 24 cows. The tendency in recent years has been for producers to switch from the restrictions of cowshed milking to the more flexible yard and parlour system. At the same time, a substantial number of producers has left the industry, yet total cow numbers have been maintained at a comparatively static level, partly because of the increased capacity provided by the parlour systems. At present, there are probably over 20,000 parlour-milked herds. New parlour systems are being installed at the rate of about 1,500 a year, so that by 1972/3 the total number of such systems is likely to be approaching 30,000. In the view of the group, it is the parlour-milked herds that would take a substantial proportion of the postulated expansion of 300,000 cows; if, on average, each of these herds carried five cows more than they might have under present expectations, this would take account of about half of the 300,000 expansion. It can be held that the capital cost in buildings and equipment of housing these additional 150,000 cows has been incurred in the normal course of technological change, and therefore is not chargeable to the expansion programme.

235 The remaining 150,000 cows would be housed either in existing cowsheds, usually involving some adaptation of buildings, or in new parlour systems that would not have been installed without a special incentive to expand milk production. The group has concluded that the cost of cowshed adaptation and new buildings to house these additional dairy cows would be in the region of £25m. To this sum would be added an amount, estimated at £5m, to cover the cost of housing replacement stock, together with a further £5m for dairy equipment. It would also be necessary to spend some £5m on additional field equipment, bringing the total capital cost to £40m. Depreciating the buildings over fifteen years, the dairy equipment over 10 years, and the field equipment over five years, the annual capital cost of these items would be £3.5m a year.

236 The expansion of the dairy herd by 300,000 cows would also, it has been assumed, produce 170,000 calves a year which would be fattened for beef. The group took the view that 70,000 of these calves could be accommodated without any additional buildings being required, and that the remaining 100,000 would involve a capital cost of about £50 a head to finishing, or £5m in total. Additional field equipment might cost about £1.5m. Depreciating the buildings over ten years and the field equipment over five years, the annual capital cost would be £0.8m.

237 On these assumptions, the total capital cost involved in an expansion of the dairy herd by 300,000 cows and of fattening 170,000 of their progeny each year would be £46½m, or £4.3m annually. There would also be additional cost incurred in an expansion of creamery capacity.

#### *Capital—beef herd*

238 The group assumed that of the 300,000 additional beef cows only half would be housed indoors; it is estimated that they would involve capital expenditure at the rate of £70 a cow, or £10.5m in total, which would also provide housing for their calves up to weaning. On the basis of 85 per cent calf retention (i.e. 255,000 calves in total) fattening accommodation would be required for 210,000 extra animals a year (the remaining 45,000 a year being required as herd replacements). At £50 a head, the estimated cost would be £10.5m. There are also the additional 140,000 calves which it has been assumed would be retained

from the dairy herd if the beef market were attractive: these would also have to be housed. Again at £50 a head to finishing, the cost would be £7.0m. On the above assumptions, the total cost of buildings arising from the expansion of beef production from the beef herd and the additional beef which could be obtained by rearing more calves from the present dairy herd would be £28m, or £2.8m a year depreciated. It would not be necessary to spend the whole of the £28m by 1972 for the reasons explained in Annex 4.

239 As well as the provision of buildings, there will be need for capital spending on additional field equipment and fencing to achieve the higher stocking rate required. The cost of additional field equipment is put at £5m in total, whilst the cost of fencing on improved hill and upland areas might amount to £2m. Depreciating the field equipment over five years and the fencing over ten years the annual capital cost would be £1.2m. Thus the total capital cost of beef from the expanded beef herd and the extra calves reared from the existing dairy herd would be £4.0m a year depreciated.

#### *Manpower*

240 The Milk Marketing Board's evidence showed that the labour usage in dairy farming has dropped sharply in the past decade; in 1955/6 average labour hours per cow were 124, but by 1965/6 these had fallen to 88. The Board calculated on the basis of the 1965/6 Milk Costs Investigation that the existing labour force could cope with an increase of 75,000 cows a year with no increase in the labour force. Thus the group concludes that the postulated increase of only 60,000 cows a year on average would enable some reduction in the labour force to be made. Similarly the group believes that the existing labour could handle the larger number of beef cattle, but here they felt that no significant release of manpower would be practicable.

#### *Land*

241 Trends in grassland use are best considered in terms of all grazing livestock because of the inter-relation between cattle and sheep. The group's proposals for cattle and sheep, taken in conjunction with those of the arable group (which postulates an increase in tillage of 1.7 million acres at the expense of grass) call for an increase over 1967/8 of about 19 per cent in the density of stocking on the remaining grassland acres by the time the expansion programme is fully implemented in terms of additional fattening cattle. This is equivalent to a cumulative increase of 3½ per cent a year over a six-year period. Almost half the increase in stocking rate is necessitated by the reduction in forage acres.

242 The group examined trends in stocking rates in recent years, and noted that there had been an acceleration in the rate of increase during the past few years. Whereas over the period 1958/9-67/8 the annual rate of improvement was only 1.6 per cent a year, during 1963/4-67/8 the rate rose to 2.4 per cent a year. The group concluded that, given an appropriate balance of profitability between the arable and livestock sectors, there are good reasons for expecting stocking rates in the next few years to increase at a fairly rapid rate. First, there will be increasing pressure from the arable sector adding to the pressure from the proposed expansion in livestock numbers. The proposals of the arable group envisage a faster rate of expansion of the tillage acres between 1967 and 1972 than between 1962 and 1967—1.7 million acres compared with only 1.3 million acres during the five years to 1967. Much of the increase in tillage by 1972 would come from areas of mixed arable and livestock farming or of mainly livestock farming, and

the group believes that the pressure of numbers on the remaining grass will lead to notable improvements in efficiency of grassland utilisation.

243 Secondly, the group believes that farmers are increasingly becoming aware of the potentialities of better grassland management and that this will lead to acceleration of the already rising trend in fertiliser use. There is still enormous scope for the use of nitrogen on grass, particularly permanent grass, much of which still receives none at all.

244 A third factor, which should result in higher stocking rates for dairy cows, is the higher proportion of dairy cows that by 1972 should be calving in late winter/early spring. If the whole of the increase in dairy cow numbers were in late winter/early spring calvers the nutrient losses unavoidable in the conservation of winter fodder would be minimised and a higher density of stocking thereby facilitated.

245 In the light of these considerations, and also bearing in mind that an improvement of 3 per cent a year in the stocking rate of lowland sheep is envisaged in the sheep section of the group's report, the group concludes that an overall annual improvement of  $3\frac{1}{2}$  per cent a year in stocking rates is a realistic target which the industry could achieve. This improvement would have to continue after 1972/3 to provide land to rear and fatten the calves born towards the end of the period of expansion. Moreover, the group proposes in the sheep section of its report that about  $1\frac{1}{2}$  million acres of rough grazings should be improved over the period; a small part of this acreage should serve to offset the continuing loss of agricultural land to non-agricultural purposes. The benefits which would follow from fencing and controlled grazing of hill and upland areas, described in the sheep section of the report, apply with equal if not greater force to cattle. In this connection it is felt that the rules limiting the payment of hill cow subsidy to cows stocked at a rate of more than 5 acres to the cow are a psychological impediment to improvement and should be reviewed.

246 Given an improvement in stocking rates and in hill and upland pasture of the magnitude proposed, it should be possible to accommodate both the proposals of the livestock group for expansion of grazing livestock and those of the arable group for an expansion of the tillage acreage.

### *Fertiliser*

247 Achievement of the higher stocking rate postulated above will require a very substantial increase in the use of fertiliser. Part of this increase will arise as a consequence of the extension of the arable acreage, which would require higher rates of application of fertiliser on the remaining grassland merely to maintain the present number of livestock. Account must also be taken of the fertiliser which would have been used on the grassland and fodder acres switched to arable use.

248 Assessment of the fertiliser cost is further complicated by conflicting evidence on fertiliser response and on improvements in grass utilisation. As a basis for calculation, the group have assumed that an increase of the order of 2 cwt an acre of utilised starch equivalent from grass by the end of the expansion period would permit an increase of 15 per cent in stocking rate and that 1 lb of nitrogen would yield 6 lb of utilised starch equivalent. Thus, to accommodate the existing grazing livestock on the reduced grassland acreage, which would call for an improvement of 9 per cent in the stocking rate, would involve a net increase of £18½m in the cost of fertiliser. This includes the extra phosphate and potash that would be required and is before deduction of subsidy; it also allows for the fertiliser that would have been used on the grassland and fodder acreage

switched to arable use. Of this total, about £½m would be on account of the improved stocking rate of sheep. To accommodate the additional livestock postulated by the group there would be call for a further improvement of almost 10 per cent in the stocking rate, and a further fertiliser cost estimated at £25m. This is the only fertiliser cost which falls to be charged to the group's proposal for the expansion in the number of grazing livestock. If this cost is allocated to the beef and dairy herds in proportion to the respective increases in livestock units, and allowing for the differences in concentrate feeding, the fertiliser cost of expanding the dairy herd and fattening the resultant progeny would be about £11m and that of other additional beef production £14m. A significant part of the fertiliser cost for the beef expansion would be incurred after 1972/3.

#### *Concentrated feed—dairy cattle*

249 The Milk Marketing Board provided the group with estimates of the concentrated feed requirements for a spring calver. Based on the assumption that the cows calving in the first four months of the year would be fed 2·3 lb concentrates per gallon over the whole of their lactations, the concentrated feed requirement would be 250,000 tons. In addition 40,000 tons would be required to feed replacements. At an average cost at the farm gate of £30 a ton, the total cost would be £8·7m.

250 For dairy-bred beef from the expansion in cow numbers, the concentrated feed requirement is estimated to be 150,000 tons costing, at a farmgate price of £27 a ton, £4·1m.

#### *Concentrated feed—beef cattle*

251 On the basis of the assumptions on location and methods of rearing set out in paragraph 225, the expansion of the beef herd is estimated to require an additional 170,000 tons of concentrated feed, including the demands of the additional beef cows and their replacements. The extra beef stock arising from higher retention of calves from the existing dairy herd would require a further 130,000 tons, giving a total of 300,000 tons costing, at £27 a ton farmgate price, £8·1m.

#### *Other costs*

252 *Dairy cattle.* The dairy herd is estimated to require £10 per additional cow to cover all other resource costs. Notable among these are veterinary and medicine costs; others include sprays, straw, fuel and power and repairs. The total cost for the additional dairy cows and their replacements is estimated at at £3·6m a year. Dairy-bred beef (170,000 head) from the extra cows would require a further £0·4m.

253 *Beef cattle.* Veterinary expenses, estimated at £1 a head for the extra beef cows and 10/- a head for replacements and fattening stock, would cost £0·4m a year. The extra calves reared from the existing dairy herd would cost a further £70,000 in veterinary costs. All other variable costs including the increased use of sprays, fuel and power and repairs would cost approximately a further £1m.

#### *Total variable costs*

254 Total gross variable costs attributable to the group's proposals for the expansion of the beef and dairy herds are summarised below.

Table 38 Variable costs of expansion of beef and dairy herds/£m

	<i>Dairy cattle</i>	<i>Beef cattle(a)</i>
Fertilisers(b)	11.0	14.1
Feed	12.8	8.1
Others	4.0	1.6
Total	27.8	23.8

(a) Including extra dairy bred beef from existing dairy herd.

(b) Before deduction of subsidy.

### Import saving

#### *Expansion of dairy herd*

255 As priority is already given to the most remunerative products in allocating home produced milk for manufacture, imports of dairy products other than butter are made for reasons of trading policy rather than because milk is not available for their manufacture in Britain. Additional milk production would thus be used mainly for butter and the accompanying by-product, skim powder.

256 In 1967 the average cost (cif) of butter imported from marginal suppliers was about £290 a ton, while the price of skim powder was £112 a ton. In terms of milk the combined realisation from butter and skim powder at these prices is equivalent to a little under 23d a gallon. The quantity of skim powder which would result from the degree of expansion of milk production postulated would, however, be much greater than the present level of imports, though demand for skim powder by 1972/3 should be substantially higher because of the extra requirement for the livestock postulated in the group's programme. Furthermore, if there were no expansion of milk output, the rising demand for milk for other uses would reduce the quantity available for butter and thus for skim milk powder. It seems likely, however, that there would still be a substantial additional quantity of skim powder not required on the home market, which would have to be used for stockfeeding or otherwise disposed of at considerably lower prices. It would be prudent, therefore, to reduce the combined realisation from butter and skim to say 21d a gallon. On this basis the gross import saving from the proposed additional milk would be £24.7m a year.

257 Expansion of dairy cow numbers and the fattening of their progeny would also result in the production of 59,000 tons of additional beef. Valued at the average 1967 cost of Argentine beef (£225 a ton) the gross import saving would be £13.3m plus say £1m for offal and hides, bringing the total gross import saving resulting from the expansion of the dairy herd to £39m.

258 To calculate the net import saving contribution of this expansion it is necessary to deduct the imported inputs that would be used by the industry as well as the home produced feed used, the import saving contribution of which is credited to the arable sector. Home grown beans would amount to £3.6m and the value of cereal feed, valued at £24 a ton, would be £8.7m. The import content of fertiliser used on grass is estimated at £2.2m while that of fuel and oil might amount to £0.7m. Some imported materials would also be used in the additional buildings and equipment required for the expansion—say £0.5m a year. Thus the sum of the imported inputs and home produced feed used in the annual production of an additional 282 million gallons of milk and the associated production of 59,000 tons of beef would be £16m a year, reducing the net

import saving contribution attributable to the livestock sector from this expansion to £23m a year.

#### *Expansion of beef herd*

259 The additional quantity of beef directly attributable to the group's proposals for expanding the beef herd amounts to 64,500 tons a year. To this must be added the 35,000 tons of additional beef which would be obtained from the existing dairy herd as a result of measures taken to improve the profitability of beef production and the stability of beef markets. The resultant gross import saving, again at £225 a ton, would amount to £24.4m a year, including £2m for offal and hides. Deducting, as before, imported inputs totalling £4.1m (£2.8m for fertiliser, £0.8m for fuel and oil, and £0.5m in buildings and field equipment) together with the value of home produced protein in the form of beans (£1.5m) and cereal feed (£6.5m at £24 a ton), the net import saving contribution from the expansion of the beef herd and the rearing of more calves from the existing dairy herd would be £12½m a year.

260 Adding to this total the beef obtained from the expansion of the dairy herd, the net import saving contribution of which is estimated at about £9m, the total net import-saving contribution from beef amounts to £21½m a year. Taking milk and beef together, the total net import saving attributable to the livestock sector from cattle would be £35½m a year (to which has to be added the contribution from the arable sector through expansion of home production of cattle feed).

### **Conclusion**

261 The programme of expansion for the dairy herd that the group has put forward—300,000 cows by 1972/3—is a modest one; it provides for the extra demand for milk and milk products postulated by 1972 at 1966 prices. The group proposes this degree of expansion in the belief that it is comfortably within the capacity of the industry, provided the producer was not penalised for the extra production. Undoubtedly a much bigger expansion could be induced, which would result in a useful reduction in the existing level of imports of dairy products, but this could only be obtained at the expense of some other grazing livestock or arable enterprise.

262 Whilst on biological grounds the availability of stock is no impediment to a substantial expansion of beef production, and it is possible that the increase of 300,000 beef cows by 1972/3 could be obtained without substantial changes in present support arrangements, it is clear that the considerable change in management decisions which would be required for expansion on such a scale would not come unless there were confidence throughout all sectors of the beef industry that the market would give a more stable and satisfactory return at all stages of production—for calves and stores as well as for fatstock.

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## **Sheep**

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### **Introduction**

#### *Relative importance*

263 The average value (including deficiency payments) of sales of fat sheep and lambs during three years to 1967/8 was £86m a year, and the addition of sales of wool brought the total value of sales of this sector of the livestock industry to £102m. This represented 8 per cent of the value of sales of livestock and livestock products and 5 per cent of total farms sales.

*Balance of home supplies and imports*

264 Total supplies of mutton and lamb, including the small quantities exported, amounted to 587,000 tons a year on average during the three years 1965-67. Supplies retained for consumption averaged 582,000 tons. Home fed mutton and lamb provided 43 per cent of total supplies during this period. A small and declining contribution from Irish stores is included in this figure, but it amounts to no more than about 1,000 tons a year. The value of imports of mutton and lamb in 1967 was £69m, plus about £½m for Irish fatstock and stores. New Zealand was the main supplier, accounting for £61m of imports, the remainder coming from Argentina, Australia and the Irish Republic.

265 The value of imports of wool, £100m in 1967, is much greater than that of mutton and lamb. Though an exact comparison is difficult to make, the home industry provides about 12 per cent of total wool supplies by value. Exports of home produced wool amounted to £9m in 1967.

**Table 39 Supplies of mutton and lamb in the United Kingdom/'000 tons**

	1962	1963	1964	1965	1966	1967
Home fed slaughter	248	240	251	235	265	258
Irish fatstock	2	1	1	1	1	—
Imports	352	342	339	345	316	341
<b>Total</b>	<b>602</b>	<b>583</b>	<b>591</b>	<b>581</b>	<b>582</b>	<b>599</b>
Exports and re-exports(a)	n.a.	3	5	2	6	7
<b>Retained supplies</b>	<b>n.a.</b>	<b>581</b>	<b>587</b>	<b>579</b>	<b>576</b>	<b>589</b>

(a) Excluding live exports, amounting to 10,000 tons in 1963, falling to 4,000 tons in 1967

*Future demand*

266 With the home industry providing less than half of total supplies of mutton and lamb, demand is not a limiting factor to expansion. Nevertheless the trend in demand is downward, and although by 1972 rising population and rising incomes will tend to raise consumption, assuming 1966 price relationships are unchanged the swing in consumer preferences against mutton and lamb will more than offset the benefit from rising population and income. The demand group postulated a fall of about 40,000 tons, or 7 per cent, in demand for mutton and lamb, at 1966 prices, by 1972.

*Output*

267 The upward trend in sheep numbers evident throughout the 1950s slackened at the beginning of the 1960s and began to turn downward in 1966 and 1967. Total numbers of sheep and lambs reached a peak of 30·0m in 1966, but the beginning of a downward trend was evident in the fall to 28·9m in June 1967, which included a fall of 362,000 in the number of breeding ewes and shearlings.

268 For some years there has been a switch in the areas carrying sheep away from the lowlands to the uplands and to a lesser extent the hills. Not all the lowland areas have lost sheep; the decline has been most marked in the midland counties, whilst the smaller numbers in the eastern and southern counties have suffered comparatively little change. Sheep numbers have tended to increase in the upland areas rather than in the hills, though Table 40 below, which shows the



trend in sheep numbers, indicates that there has been a modest increase in the number of sheep qualifying for hill sheep subsidy. The 1967 Annual Review extended the area eligible for hill sheep subsidy; this was expected to make an additional 2 million ewes eligible for this subsidy and so to encourage an expansion of sheep production in upland areas.

**Table 40 Sheep numbers in the United Kingdom/million**

	1962	1963	1964	1965	1966	1967
<i>June</i>						
Ewes	11.8	11.8	11.9	11.9	12.0	11.8
Shearlings	2.5	2.5	2.5	2.6	2.6	2.5
Total ewes and shearlings	14.3	14.3	14.4	14.5	14.6	14.2
Total sheep and lambs	29.5	29.3	29.7	29.9	30.0	28.9
<i>December</i>						
Sheep on which hill subsidy paid						
England and Wales	2.4	2.4	2.5	2.6	2.6	
Scotland	2.4	2.4	2.4	2.5	2.5	
N Ireland	0.2	0.2	0.2	0.2	0.2	
Total	5.0	5.0	5.1	5.3	5.3	

## **Prospects for expansion**

### *Lowland sheep production*

269 The down-turn in lowland sheep numbers which has taken place over the past few years cannot be attributed wholly to the level of the guaranteed price, which had been practically stationary between 1957 and 1966, for other review commodities, notably eggs and barley, have also lacked price incentives for expansion, and yet substantial increases in production have occurred. It seems that the great technological revolution that has characterised most branches of British farming over the past twenty years has largely by-passed the fat lamb industry. Certainly it has not experienced the increases in productivity that have characterised pig, poultry and milk production. In a large measure this may be attributed to the fact that lowland farmers are not so committed to sheep with their side-line role as they are to pigs, poultry and dairy cows in the sense that these latter animals require a substantial investment in specialised buildings and fixed equipment. Once this investment has been made there is the continuing need to safeguard it whereas with sheep, the capital commitment which is specific to the product is small, apart from that in the flock itself, and this can be easily realised by selling the flock. In other words it is comparatively easy for lowland farmers to get out of sheep and devote the resources that are freed by such action to other farming activities that are currently more attractive to them. This has occurred on a considerable scale and the main benefactors in this change have been cereal production and to a lesser extent beef production, which has been made more attractive by price incentives. (Between 1956 and 1967 the

guaranteed price for fat lamb rose by only 3.3 per cent while the corresponding increase for beef was 25 per cent).

270 Another factor that has contributed to the decline in the comparative popularity of fat lamb production has been the traditional attitudes of flock-masters who tend to be a law unto themselves in respect of the welfare of their flocks. Usually they are more concerned with the individual excellence of their sheep than they are with output per acre or per labour unit and there has been a reluctance to adopt more intensive systems of stocking in the expectation that the quality of lambs will be impaired. The belief that a sheep's worst enemy is another sheep dies hard, despite the substantial increase in knowledge of the nature of sheep diseases and infections and the availability of effective drugs and vaccines to control their incidence. Apart from these advances in protective medicine, which have yet to be fully realised, there have been other promising husbandry developments which suggest a possibility of the gross margin from sheep becoming reasonably comparable with that obtainable from cereal growing. These include creep grazing, the development of more prolific breeds, field hygiene to control worms and, on heavier land, inwintering to protect pastures from the severe poaching which limits carrying capacity in the early spring. One cannot expect, however, that there will be a rapid realisation of these developments, though perhaps the 6 per cent increase in the price of lamb at the 1968 Annual Review will give established producers more confidence to innovate and intensify. The most that can be hoped, in view of the ploughing out of more grassland for cereal production, is that the number of breeding ewes on lowland farms will be maintained over the next five years, with some appreciable increase in stocking intensity, which will necessitate a greater expenditure on fertilisers, drugs and vaccines, fencing and supplementary concentrate feeding. It is unlikely, however, that additional annual expenditure on this score will be significant. The expectation is that there will be a slight but appreciable increase in lambing percentages due to the use of more prolific crosses, but it is not anticipated that revolutionary techniques such as stimulation of ovulation rates by hormone administration and artificial rearing will have any measurable commercial impact in the next five years.

271 In summary, it is unlikely that lowland fat lamb production will do little more than maintain the current level of output, but there will be an appreciable saving in the land devoted to sheep, of the order of 3 per cent per annum.

#### *Hill and upland sheep production*

272 Apart from afforestation, the only alternative to sheep production in the hills and uplands is the production of suckler calves, which, through direct subsidies and rises in the guaranteed price for beef, has become the more favoured farming enterprise on the uplands and in the more productive hill areas. Other impediments to expansion include the rigidity of farm size and structure, and the problems arising from the 2m acres of common land.

273 Nevertheless there has been an upward trend in sheep numbers in these areas and this helps to substantiate the strong belief that cattle have an additional value to the cash income they provide, namely that they improve the quality of grazing for sheep. Increases in the hill sheep subsidy and a widening of the eligibility of ewes for subsidy payments have undoubtedly increased confidence in this sector of sheep farming, but most producers are affected by the uncertainty of store market prices. Unquestionably there are large areas in the uplands which are capable of improvement to the point where fat lambs rather than stores can be sold from farms and this is being increasingly realised by

farmers in these areas who are taking steps to protect themselves from the vagaries of store markets.

274 The group was given convincing evidence by the Hill Farming Research Organisation that greater subdivision in order to effect better control and rationing of grazing is a key factor in improving carrying capacity, lambing percentages and quality of lambs. Ancillary to this on the more tractable areas, is improvement that can be effected by liming, slagging, oversowing and drainage. It is estimated that there are at least five million acres of land in the United Kingdom which are capable of improvement by such methods to the point where carrying capacity could be improved by at least 50 per cent in the foreseeable future, given the necessary incentives and capital injection. It is unlikely that improvements of this order could be effected on more than 1½m acres in the next five years. Much of the value of this improvement will be realised in terms of increased cattle production and so it is estimated that the increase in lamb production, attributable to more ewes and better lambing percentages, will be of the order of 300,000 lambs per annum by 1972/3.

### **Cost of resources**

#### *Lowlands*

275 On the assumptions made in paragraph 270, the only additional costs to be assessed which arise as a result of greater stocking density rather than from proposals of the group for expansion amount to £½m for fertilisers, veterinary costs, fencing and supplementary feed.

#### *Hills and uplands*

276 On the assumption that, of the 1½m acres that the group postulated will be improved by 1972/3 the equivalent of 1m acres will be used for sheep production, it is estimated that £4m will be required over the next five years for fencing and such buildings as hog houses to avoid the heavy costs of off-wintering, which is becoming increasingly difficult to obtain. Such an investment would depreciate at the rate of £0·4m per annum. In addition there would be annual variable costs covering such items as fertilisers, (£0·4m) purchased feedstuffs (£0·1m) and other costs such as veterinary requisites amounting to £0·6m per annum. Thus the total annual cost would be about £1m. It is assumed that no additional labour would be required.

### **Import saving**

277 It is estimated that the total increase in output would be of the order of 4,500 tons of lamb and 1,000 tons of mutton a year. At £209 a ton for lamb and £140 a ton for mutton (the average import prices in 1967) the gross import saving would be £1·1m. To this must be added the value of the additional wool, pelts and other by-products of slaughter amounting to £0·4m annually. To calculate the net import saving contribution from expanding sheep production there must be deducted the cost of imported inputs and the cost of home-grown cereals, which is credited to the arable sector. Estimating each of these at £0·1m respectively, the net import saving would be £1·3m as a result of the group's proposals for an expansion of 300,000 lambs in the hills and upland areas.

### **Conclusion**

278 In postulating an expansion in production of only 5,500 tons of mutton and lamb, the group is well aware that it may be accused of having understated the import-saving contribution which the sheep industry could make if its products

were made sufficiently profitable in relation to competing livestock and arable enterprises. There is no doubt that, given a substantial change in the present balance of incentives between mutton and lamb on the one hand and other livestock products and arable crops on the other, a greater increase in output could be induced, in much the same way that an expansion in the dairy herd beyond the postulated 300,000 cows could be induced by change in the balance of incentives. Sheep do not have to compete with other enterprises in the hills, but if there were to be an expanded lowland market for hill store lambs, this would again be at the expense of some other grazing livestock or arable enterprise. The group's proposals should also be seen in the context of the downward trend in sheep numbers evident for the past two years, which might well have gathered momentum. It remains to be seen whether the encouragement given to the industry at the 1968 Annual Review will succeed in checking this downward trend.

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## Pigs

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### Introduction

#### *Relative importance*

279 The average value of sales of fat pigs off farms in the United Kingdom in the three years to 1967/8 was £208m a year, accounting for 16 per cent of sales of livestock and livestock products and 11 per cent of the total value of sales off farms.

#### *Balance of home production and imports*

280 Government policy under the selective expansion programme envisages that home production will meet the whole of the growth in demand for pork as well as the United Kingdom's share of the bacon market under the Bacon Marketing Sharing Understanding.

281 Home production of pigmeat is affected by the notorious pig cycle; Table 41 shows that commercial production reached a peak of 886,000 tons in the calendar year 1965, but dropped back to 857,000 tons in 1966 and to 788,000 tons in 1967. About 70 per cent of the total is consumed as fresh pork or manufactured into products other than bacon. In addition there are imports of both fresh and manufactured pigmeat, but the former account for only 2 per cent of the market, which is thus supplied almost entirely by the home industry. Imports of manufactured pigmeat are, however, substantial. Apart from bacon and ham, some 60,000 tons of other canned pigmeat are imported, bringing the share of imports up to about 10 per cent of the total market for fresh pork and manufactured pigmeat other than bacon and ham.

282 For bacon and ham, however, the position is far different. The Bacon Market Sharing Understanding currently allows 37 per cent of the British bacon market (excluding canned bacon and ham) to be supplied by the home producer; in practice, the fall in production in 1967 resulted in the home producer providing only 33 per cent of supplies in the calendar year, and if canned bacon and ham are included the proportion was even lower. The home industry thus supplies only about 50 per cent of the total pigmeat market.

283 The total value of imports of pork and bacon and ham (including canned products) reached £166m in 1967; imports of fresh pork cost only £2.6m, canned bacon and ham £18m, other canned pigmeat £22m, while imports of bacon cost no less than £124m. Pigmeat is the biggest constituent of the total imports of meat which cost £373m in 1967.

**Table 41 Production and imports of pigmeat in the United Kingdom/000 tons**

	1962	1963	1964	1965	1966	1967
<i>Pork and manufactured pigmeat</i>						
Home production	499	522	557	614	605	552
Imports—fresh	20	11	10	21	10	11
canned	55	55	59	58	61	65
Total	574	588	626	693	676	628
Home as % of total	87	89	89	89	89	88
<i>Bacon and ham</i>						
Home production	222	217	219	228	215	202
Imports—canned	35	30	36	36	33	34
other	399	385	391	397	397	402
Total	656	632	646	661	645	638
Home as % of total	34	34	34	34	33	32
<i>Total home production of pigmeat</i>						
	761	780	818	886	857	788
Home as % of total pigmeat (est.)	60	62	62	63	63	61

*Note:* Exports and re-exports of pigmeat are small—eg 3,000 tons in 1967, 12,000 tons in 1966, 4,000 tons in 1965.

### *Future demand*

284 Demand for pork has been rising strongly in recent years, while demand for bacon has tended to fall slightly. The demand working Group postulated an increase between 1966 and 1972 of some 70,000 tons in the total demand for pigmeat, to nearly 1,400,000 tons: this took account of the increase in population and incomes expected by 1972, and assumed no changes in price relationships. It was thought that demand for bacon may fall by 10,000 tons, while demand for pork and manufactured pigmeat may rise by 80,000 tons. Imports are much larger than the postulated increase in demand and there is plenty of scope for higher home output by 1972.

### **Prospects for expansion**

285 The total size of the pig breeding herd varies cyclically. It reached a peak of 958,000 in March 1965 and the subsequent trough was reached in December 1966, when 808,000 were recorded; by June 1967 the total breeding herd had recovered by 16,000 to a total of 824,000. The prolificacy of the sow is such that a very rapid rate of expansion is biologically possible—the breeding herd could, for example, be at least doubled in size by 1972/3. But the group considers that an annual average increase of 70,000 sows a year throughout the period is the maximum which is likely to be achieved, given favourable circumstances. (See paragraph 294). In reaching this conclusion the group took into account the fact

that the previous highest increase from year to year was 80,000 sows. The group assumes that in the first year the increase would be below the average figure for the five year period and that there would also be some falling off in the rate of expansion towards the end of the period. On the above assumptions the breeding herd would reach 1,174,000 by June 1972 and pigmeat output about 1,130,000 tons.

#### *Trends in productivity*

286 The group thinks it unlikely that there would be a further increase in 1972 in the number of piglets reared per sow. This view does not imply that the improvement in sow productivity which is taking place as a result of improved management, such as early weaning, will come to an end; it recognises, however, that to obtain the degree of expansion envisaged, poorer sows will have to be retained for breeding, and that in the past an expansion in the breeding herd has resulted in a fall in the number of pigs reared per sow.

287 In the longer term, it is expected that the Accreditation Scheme and the use of AI will lead to an increase in productivity, but in the short run period to 1972 the effect of these schemes is likely to be small. There is some evidence that the efficiency of food conversion has been increasing, and an improvement of 1 per cent a year may be expected during the period under review. Similarly, labour productivity is also believed to be improving..

### **Cost in resources**

#### *Housing*

288 An expansion of the size postulated in paragraph 285 would require a heavy capital investment. Structural changes in the industry, with a sharp decline in the number of holdings with sows, mean that the increase in sow numbers would probably be greatest in the larger herds though given a stable market for weaners small breeding herds would remain viable. It is reasonable to assume that some 75,000 sows could be accommodated in existing housing without significant capital expenditure, but the cost of housing the remaining 275,000 additional sows, on the basis of estimates agreed by PIDA, would be £33½m. The associated investment in housing for the feeding herd would amount to some £27m, giving a total investment cost of £60½m for new housing. This would imply a continuing annual cost of £6·0m, assuming a depreciation period of ten years.

#### *Feed*

289 On the basis of 30 cwt of feed consumed by each sow and her litter and 5 cwt by each slaughter pig, the additional feed requirement would amount to 525,000 tons for the breeding herd and 1,400,000 tons for the feeding herd, giving a total requirement of 1,925,000 tons. An improvement in the efficiency of food conversion of 1 per cent a year over the period would reduce this requirement to 1,835,000 tons. On the basis of an 85 per cent cereal ration, some 1,560,000 tons of cereal and 275,000 tons of protein would be required. At a farmgate price of £30 a ton for the mixture the cost would be £55m a year. Assuming that the additional cereal would be provided from home production, the only import cost would be for protein. If most of the additional protein had to be imported the cost, on the basis of the post-devaluation import cost of fishmeal (£55 a ton), would be £12m. To the extent that skim milk were fed there would be a corresponding reduction in the amount of imported protein required.

### *Other variable costs*

290 Other costs would be involved in an expansion of pig production, particularly veterinary expenses. On the basis of 10/- up to weaning and 6/- during fattening these costs are estimated at £4.4m.

### *Manpower*

291 An expansion of this order of magnitude could not be obtained without an increase in the labour force. It is reasonable to assume that the 75,000 sows which could be accommodated in existing housing would not require any additional labour. The remaining 275,000 sows however, would call for some 8,500 additional full-time male workers, or their equivalents, at present levels of labour productivity. It is possible, however, that with continuing improvement in the productivity of the labour force across the whole of the pig industry and the availability of family workers, a much smaller increase in the number of workers would suffice.

### **Import saving**

292 An increase of 350,000 sows in the breeding herd would yield about 335,000 tons of pigmeat a year. On the basis of the projections of the demand working group, adjusted to take account of the fall in supplies in 1967, the pork and manufactured pigmeat market would take 135,000 tons, leaving 200,000 tons of pigmeat for bacon. This would yield about 170,000 tons of bacon, the import cost of which would be £52m at the average 1967 import price of £307 a ton. Assuming that the extra demand for pork and manufactured pigmeat would otherwise be met by imports and again calculating on the basis of average 1967 import prices the import saving on this pigmeat would be £32m. The total gross import saving would thus amount to £84m.

293 To calculate the import saving contribution of expanding pig production, it is necessary to deduct the imported inputs that would be used by the industry as well as the home produced feed, the import saving contribution of which is credited to the arable sector. Assuming home produced beans provided £3m of protein, imported protein would amount to £12m, and the cost of cereal feed, valued at £24 a ton, would be £37½m. Some imported materials would also be used in building the additional housing required for the expansion—say £½m annually. Thus the net import saving by 1972/3 resulting from an expansion of 350,000 in the number of sows, on the assumptions made above, would be £31m a year (apart from the contribution from the arable sector through expansion of home production of cereals).

### **Conclusion**

294 To achieve an expansion in the breeding herd averaging 70,000 sows a year over a period as long as five years, producers would need favourable conditions, foremost amongst which would be a guarantee of stability in their returns over the period of expansion. This would require a more effective means of ironing out major price fluctuations.

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## **Poultry**

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### **Introduction**

#### *Relative importance*

295 The total value to producers of sales of eggs and poultrymeat was £268m a

year on average in the three years to 1967/8. This represented 21 per cent of total sales of the livestock sector, and 14 per cent of total farm sales. Eggs were valued at £175m, nearly twice as much as the value of sales of poultrymeat.

#### *Balance of home supplies and imports*

296 Home production of eggs accounts for all but about 2 per cent of total supplies of eggs in shell, and even when imports of egg products are taken into account, total imports account for only about 4 per cent of total supplies of eggs and egg products. During the last three years, imports of eggs in shell have cost £2m-3m a year, whilst egg products have cost a further £2m-£3m.

297 Home production of poultrymeat similarly accounts for the major part of total supplies, and during the last three years imports (mainly fowls) have cost only £2m-£3m a year. There are also some imports of processed turkey meat, which are not separately recorded in the trade statistics but are believed to amount to about £½m a year.

### **Prospects for expansion**

#### *Hen eggs*

298 United Kingdom production of hen eggs has been rising gently for a lengthy period and is forecast to have reached a peak of 1.23 thousand million dozen in 1967/8. Following the previous peak of 1.22 thousand million dozen in 1964/5, the market tended to be overloaded and there was a fall of about 5 per cent in flock numbers in the following two years, but in 1967/8 there was some recovery in numbers as well as further improvement in yield.

299 Little change in consumption a head is expected over the next five years and virtually the only increase in demand will be that arising from the growth in population. With exports of eggs in shell limited through international undertakings and exports of egg products unremunerative, there is no case for an increase in the size of the flock. The group accepts the view of the British Egg Marketing Board that the existing flock size will be sufficient to meet the increased demand, estimated by the demand group at 55 million dozen. Not only will the existing flock produce the necessary number of eggs by an increase in yield but it will also do so without requiring additional feed. The continuing establishment of large units will lead to changes in the structure of the industry, and call for appreciable capital investment, but this is not in any way related to the slight increase in output required. If imports of shell eggs could be prevented from entering the country the industry would, of course, be able to supply the whole of the market, though this would require some minor change in the seasonal pattern of output.

#### *Poultrymeat*

300 In contrast to the egg situation, the poultrymeat sector is very buoyant. Total supplies of home produced poultrymeat—imports are negligible—have risen from 307,000 tons in 1960/1 to a forecast 455,000 tons in 1967/8, and the demand group project that at 1966 prices the total market could reach about 660,000 tons by 1972/3. This projection has to be regarded as more tentative than those made for relatively stable commodities. Other evidence taken into account, including that received from the Federation of British Poultry Industries, has led the group to adopt a figure of 600,000 tons as a conservative estimate of the market for poultrymeat in 1972/3. The group anticipates that output of broiler chickens will rise from 300,000 tons in 1966/7 to at least 450,000 tons, while production of turkey meat should rise from under 40,000



tons to at least 60,000 tons. A continuing small supply from ducks and geese (under 10,000 tons) and other poultrymeat from fowls, mainly culled bens, will make up the balance of supplies.

## **Cost in resources**

### *Capital*

301 *Broiler chickens* The number of broiler chickens produced in 1966/7 was about 200 million; to meet the expected increase in demand production would have to rise by 100 million by 1972/3. The Federation of British Poultry Industries informed the group that considerable further improvements in efficiency are expected by the industry by 1972/3. These are likely to result from better control of disease, improved nutrition, more knowledge of the optimum environment and higher management skills. Further progress by breeders will doubtless be made, but the main improvement is seen as arising from the fuller exploitation of existing genetic potential by disease control rather than by further improvements in this potential. As a result there should be higher egg production from the breeding stock, a shorter growing cycle and improved feed conversion. These improvements should make the expected expansion by 1972/3 much cheaper in terms of capital and other resources than would be the case at the present time. The Federation estimated that the capital required for flock farms and growing farms, on the basis of 100 million extra broilers a year, would be £4m at the higher levels of efficiency expected by 1972/3, compared with £16m at present levels. Other capital expenditure required for foundation breeding farms and hatcheries would amount to £1½m. On this basis the total capital cost would be £5½m.

302 *Turkeys* There is considerable variation in the intensive methods adopted for turkey production. Hence it is less easy to estimate the capital requirements for expansion than in the case of broiler chickens. On the basis of estimates provided by the Federation of British Poultry Industries, the capital requirements for an additional five million turkeys per annum would be about £4m at present levels of efficiency. As in the calculation for broiler chickens this estimate covers all stages of production; it assumes that the additional output would be obtained from five large units. If the output were obtained from a larger number of smaller units the capital cost would be rather higher; on the other hand increases in productivity would reduce it substantially. There is plenty of scope for improvement in disease control to reduce the high rate of mortality, which averages 15 per cent compared with 4 per cent for broiler chickens, and also for improvement in fertility and hatchability so as to raise the number of poults per hen from 30 to say 40 during the next five years.

### *Labour*

303 *Broiler chickens* It is estimated that expansion of broiler chickens by 100 millions a year by 1972/3 would require about 800 additional workers, after taking into account the improvements in productivity mentioned in paragraph 301. A more substantial increase would be required in labour in processing plants, but this does not fall to the group to assess.

304 *Turkeys* The production by 1972/3 of five million additional birds a year in large units would require about 500 additional workers, apart from workers in processing plants. There would be some economies in the use of labour on existing production units as these become more intensive, but it is difficult to quantify the saving.

305 Thus the total farm labour requirement for the postulated expansion in

poultrymeat production would be a maximum of 1,300 workers but improvement in efficiency of turkey production should lead to some reduction in this figure. A saving in manpower through increased productivity in egg producing flocks should counterbalance this extra demand.

### *Feed*

306 *Broiler chickens* An expansion of 100 million broilers a year would require 420,000 tons of feed, at the conversion rate of 2.1 expected by 1972/3. In addition, the associated breeding stock is likely to require some 50,000 tons of feed. If the proportion of home-grown cereals in rations can be raised to 70 per cent and the proportion of maize reduced to 10 per cent—as the group believes should be the target—330,000 tons of home-grown cereals would be required for the expansion. At a farmgate price of £37 a ton, the cost of all the additional feed would be £17.4m. At import prices, the value of the home-grown cereals content, at £24 a ton, would amount to £7.9m; the maize, at £25 a ton, would be £1.2m and the protein, on the basis of the price of imported fishmeal (£55 a ton) would be £5.2m.

307 *Turkeys* Although the food conversion rate for turkeys is at present slightly poorer than that of broiler chickens, there are grounds for believing that by 1972/3 the rates will be very close. Assuming the same conversion rates for turkeys as for broiler chickens, some 66,000 tons of feed would be required by the additional 5 million birds postulated for 1972/3. Following the assumptions made for broiler chickens, some 53,000 tons would be cereals, of which 7,000 tons would be maize. The other 13,000 tons would be protein. The farmgate cost would be £2.4m; at import prices, the value of home-grown cereals would be £1.1m, maize £0.2m, and protein £0.7m.

### *Other costs*

308 On the basis of 30/- per 100 broiler chickens reared and £4 per 100 turkeys, other costs would amount to £1.5m and £0.2m respectively.

### **Import saving**

309 If the additional demand for poultrymeat were to be met by imports rather than by expansion of the home industry, these would cost about £40m at average 1967 import prices. (It may not, however, be wholly realistic to apply those prices to the much larger quantity of imports postulated.) If imports of eggs were eliminated by 1972/3 a further £5m would be saved.

310 To calculate the net import saving contribution from expanding poultry production, it is necessary to deduct the imported inputs that would be used by the industry as well as the home produced feed, the import saving contribution of which is credited to the arable sector. Imported maize—at the lower rate of usage postulated by the group—would amount to £1.4m, and imported protein to £5.9m, while the cost of other cereal feed, valued at £24 a ton, would amount to £9.0m. Some imported materials would also be used in the additional buildings—say £0.1m. Thus, the net import saving by 1972/3 over 1966/7 which would result from the postulated expansion of 176,000 tons of poultrymeat and the elimination of imports of eggs, would be about £28½m.

311 Whilst not directly related to its proposals for expansion, the group wishes to record its view that the poultry industry should seek ways of reducing its present dependence on imported cereals. A switch to home-grown cereals should be facilitated by the proposals of the arable group which call for a substantial expansion in the wheat acreage.

#### **Annex 4 The effect of the cattle production cycle on the comparison between United Kingdom beef output in 1967/8 and 1972/3**

1 The group postulates an additional production of 158,500 tons of beef resulting from the proposed expansion in the beef and dairy herds. Because of a cyclical change in beef output as a whole, the net increase in total output between 1967/8 and 1972/3 might, however, be substantially less than 158,500 tons.

2 As the accompanying diagram indicates, beef production is subject to cyclical fluctuations related mainly to overall market changes. In Britain, this cycle is modified by the significant degree of interchange possible between beef and milk production. The stages in the cycle are approximately as follows:

(a) A rise in world beef prices results in a maximum slaughter of growing cattle, including a number of heifers which would otherwise have entered the breeding herd. Cow slaughter also rises, often above the replacement rate. The strong demand for feeding cattle generates confidence in rearing and a sharp increase in calf retentions takes place.

(b) While the breeding herd remains static or even shrinks, the growing cattle population expands while its average age falls due to the heavy slaughter of older cattle and the large increment of retained calves.

(c) As the expansion matures output increases in quantity, often at the expense of quality, and prices fall. The coincidence of the production cycle in a number of countries involved in the international beef trade can result in a very large proportionate increase in the quantities handled. Consequently, when the market breaks the price fall is often quite drastic.

(d) Falling prices weaken confidence in beef production at a time when growing cattle stocks are at their maximum level. The first evidence of this loss of confidence is a sharp rise in young calf slaughter, and a fall in retention. At the same time cow slaughter falls abruptly, firstly, because fat cows bear the brunt of the fall in prices and later because a loss of confidence in beef production tends to cause a swing to milk production.

(e) A heavy slaughter campaign continues for about two years resulting in a depleted growing cattle population. At the same time the dairy herd is being built up and when the eventual decline in supplies results in a strengthening of the beef market the cycle described above re-commences.

3 It should be emphasised that there is no predictable regularity about this cycle because its shape and time scale is influenced by a variety of random factors. In the Argentine something like a four-year cycle has been operating over the past decade whereas in the United States, which is far less influenced by the international beef trade, the cycle has been much longer. In Britain there would appear to have been two cycles in the past ten years (see attached diagram), but this is not sufficient evidence upon which to base a prediction of the phase through which the cattle industry will be passing in 1972. All one would suggest is that beef supplies in international trade, and hence in the British market are likely to be plentiful up to the end of 1969 but that, given a continuation in the growth of consumer demand in the countries involved, a stronger market might well recur during the early 1970s.

4 Thus any projected expansion in beef production over the period 1967-72 should take account of the fact that a different stage in the cattle cycle may have been reached by 1972 than that through which the industry was passing in 1967 when slaughterings were at a relatively high level following the heavy retention of calves in 1965. The significant compositional differences in the cattle population

at different stages of the cycle, described above, can result in substantial changes in the ratio of breeding to growing cattle.

5 The following table illustrates the compositional changes in the national herd in recent years which have resulted from the above cycle rather than from changes in production potential:

**Table 42 Effect of the cattle cycle on beef production in the United Kingdom**

	1963/4	1966/7	1968/9(a) (Forecast)
<i>Population at June ('000 head)</i>			
Dairy cows	3,247	3,162	
Beef cows	1,013	1,106	
<b>Total</b>	<b>4,260</b>	<b>4,268</b>	<b>4,360</b>
In calf heifers	742	750	825
Growing cattle(b)			
2 years +(c)	1,051	886	889
1-2 years	2,467	2,644	2,473
Under 1 year	2,923	3,447	3,375
<b>Total</b>	<b>6,441</b>	<b>6,977</b>	<b>6,737</b>
<i>Replacements June/May (percentage)</i>			
Cows	17.9	17.2	18.5
2 years(b)(c)	40.5	36.6	32.3
Yearlings(c)	81.4	76.6	72.1
Calf retentions	71.8	78.8	80.0
Clean slaughter(b)(c)	34.4	32.3	36.3
Cow slaughter(c)	20.9	17.4	16.5
<i>Store cattle imports</i>			
(April/March) ('000 head)	637	456	600
<i>Production June/May ('000 head)</i>			
Clean slaughter(c)			
Home bred	2,214	2,283	2,450
Home fed	2,851	2,739	3,050
Cow slaughter	908	746	720
Calf slaughter	614	571	515
(a) Allowance made for foot and mouth slaughter			
(b) Home bred only			
(c) Including living exports			

6 Without attempting to predict the structure of the national herd in 1972, it is clear that, given the postulated breeding herd, the population of growing cattle available for slaughter in that year may vary widely according to the production and marketing decisions taken over the two years or so immediately preceding 1972. Thus, for example, a fall in calf retentions in 1970/1 combined with a heavy slaughter of clean cattle in 1971/2 might reduce output in 1972/3 by 250,000 head or 62,500 tons of beef.

7 Measures taken under the existing support arrangements can encourage expansion in the beef herd, but the number of calves retained for beef from the dairy herd, and the number of Irish store cattle imported, will continue to be dependent on the tone of the beef market.

8 Irrespective of any cyclical changes in slaughterings, an increase of 600,000 cows in the national herd would not in any event produce at the end of only five years the fully quantity of beef that would ultimately result. In the fifth year 120,000 heifers, equivalent to 30,000 tons of beef, would be retained instead of slaughtered; none of the 28,500 tons of beef from additional cull cows would have become available; and perhaps a third of the calves from the increased herd would be fattened only after the end of the period (30,000 tons). Thus, in theory, production would be 88,500 tons below the eventual potential in the fifth year of expansion. As well as affecting the beef obtainable by 1972/3, this factor would also serve to reduce the amount of land, the additional investment in fattening accommodation, the quantities of fertiliser and feed, and other resources which would be required by 1972/3.

# The United Kingdom cattle cycle at June

Vertical scale: 1 inch = 250,000 head

Forecast

Total breeding cows

Total growing cattle

Total cattle under 1 year

Note: for convenience, the vertical relationship between the three curves has been altered.

Strong Beef Market

Weak Beef Market

Strong Beef Market

Weak Beef Market

1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968

Annex 5 Cost of resources re-quired for livestock expansion/£million

	Fixed capital		Annual variable physical inputs after expansions complete				Total annual capital and variable physical inputs
	Total	Annual depreciation	Concen- trate feed(b)	Fertilis- ers(c)	Others	Total	
<i>Dairy cattle</i>							
Dairy cows	40.0	3.5	8.7	8.4	3.6	20.7	24.2
Dairy bred beef(a)	6.5	0.8	4.1	2.6	0.4	7.1	7.9
<i>Beef cattle</i>							
Cows and fattening cattle	26.5	3.0	4.6	11.3	1.2	17.1	20.1
Additional beef from existing dairy herd	8.5	1.0	3.5	2.8	0.4	6.7	7.7
<i>Pigs</i>	60.5	6.0	55.0	—	4.4	59.4	65.4
<i>Poultry</i>							
Layers	—	—	—	—	—	—	—
Broilers	5.5	0.6	17.4	—	1.5	18.9	19.5
Turkeys	3.5	0.4	2.4	—	0.2	2.6	3.0
<i>Sheep</i>	4.0	0.4	0.1	0.4	0.1	0.6	1.0
<b>Total</b>	<b>155.0</b>	<b>15.7</b>	<b>95.8</b>	<b>25.5</b>	<b>11.8</b>	<b>133.1</b>	<b>148.8</b>

(a) From expansion in dairy cow numbers only.

(b) At farm gate prices.

(c) Before deduction of subsidy and post devaluation.

In addition, extra resources will be required for land improvement, arising from the expansion of the arable sector. These are estimated, after allowing for savings on the grass and fodder crop acreages ploughed out to arable crops, at £2.0m a year depreciated for drainage, lime and irrigation, plus £19m a year almost entirely for fertilisers.

# 3 Horticulture

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## The industry as a whole

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### *Relative importance*

312 The United Kingdom horticultural industry is a complex of several sub-industries whose output in recent years has been valued at about £185m, some 9–10 per cent of the total value of sales off farms. After rising by over 11 per cent between 1963/4 and 1964/5, the value of output levelled out during the following two years. The industry can conveniently be considered in three broad categories—vegetables (including glasshouse vegetables), fruit, and flowers and nursery stock. Of these categories, vegetables are the greatest in value of output, accounting for a little over half the total. Of the remainder, fruit is still rather more important than flowers and nursery stock, but the gap between them is narrowing.

### *Balance of home production and imports*

313 Total supplies of vegetables, fruit, and flowers and nursery stock (including non-temperate produce) have risen significantly in value over the last few years, from £333m to 1962/3 to £384m in 1966/7. Within these total supplies, the share of British and Channel Islands growers rose from 53 per cent in 1962/3 to 55 per cent in 1964/5 but fell back slightly in 1966/7. There were, however, marked changes during this period in the pattern of home output. There was an increase of 18 per cent in the value of the output of vegetables; the value of flowers and nursery stock increased at an even faster rate, while that of fruit remained steady. Channel Islands supplies rose from £14m to £17m over the period.

314 Imports of horticultural products (excluding Channel Islands supplies) showed a similar rise in total value over the period (from £156m to 1962/3 to £179m in 1966/7). Of the total imports, fruit accounted for about two-thirds and vegetables for most of the remainder. The value of fruit imports has risen steadily over the period, with vegetable imports rising at a rather slower rate and flower imports remaining fairly level.

315 A substantial proportion of the imports of fresh fruit and vegetables cannot, of course, be grown economically in Britain for climatic reasons, or if grown, cannot be grown on a continuing basis throughout the year. The scope for import saving is, therefore, much less than might appear from the above figures, unless there were interference with the freedom of consumer choice. Imports of most directly competing produce are, in fact, already limited by quota or tariff during the home season. Table 44 represents an attempt to assess the degree of self-sufficiency of the British horticultural industry by relating home output of fresh fruit and vegetables and supplies from the Channel Islands to the imports of broadly similar products during the period of marketing the home crop. Thus, besides excluding non-temperate products, the table also excludes imports of temperate produce imported outside the home marketing season. It shows that for fresh vegetables and fruit, the home and Channel Islands growers normally provide over three-quarters of supplies entering the



market. This leaves an upper limit of about £45m worth of imported fresh fruit and vegetables that could, other considerations apart, be grown at home.

**Table 43 Supplies of fresh vegetables, fruit and flowers to the United Kingdom/  
£million**

	1962/3	1963/4	1964/5	1965/6	1966/7
<i>Fresh vegetables</i>					
Home output	85.7	88.2	95.9	94.8	101.2
Channel Islands supplies	10.9	9.7	9.5	13.0	12.9
Imports	47.3	54.2	50.1	51.1	54.7
<b>Total</b>	<b>143.9</b>	<b>152.1</b>	<b>155.5</b>	<b>158.9</b>	<b>168.8</b>
Home share (%)	60	58	62	60	60
Channel Islands share (%)	8	6	6	8	8
<i>Fresh fruit</i>					
Home output	47.2	43.6	50.5	46.8	47.0
Channel Islands supplies	*	*	0.1	*	*
Imports	98.4	94.1	101.8	104.9	114.1
<b>Total</b>	<b>145.6</b>	<b>137.7</b>	<b>152.4</b>	<b>151.7</b>	<b>161.1</b>
Home share (%)	32	32	33	31	29
Channel Islands share (%)	*	*	*	*	*
<i>Flowers, bulbs and nursery stock</i>					
Home output	30.5	34.0	38.0	39.7	40.0
Channel Islands supplies	3.2	3.7	3.8	4.3	4.4
Imports	10.4	9.4	10.5	9.9	9.7
<b>Total</b>	<b>44.1</b>	<b>47.1</b>	<b>52.3</b>	<b>53.9</b>	<b>54.1</b>
Home share (%)	69	72	73	74	74
Channel Islands share (%)	7	8	7	8	8
<i>Total</i>					
Home output	163.3	165.7	184.4	181.3	188.2
Channel Islands supplies	14.1	13.4	13.4	17.3	17.3
Imports	156.1	157.7	162.4	165.9	178.5
<b>Total</b>	<b>333.5</b>	<b>336.8</b>	<b>360.2</b>	<b>364.5</b>	<b>384.0</b>
Home share (%)	49	49	51	50	49
Channel Islands share (%)	4	4	4	5	5

*Notes:*

1 In Table 43 the figures for home output include peas and beans, valued at £17m to 1966/7, which have been considered by the arable working group. The import figures include about £10-11m for dried peas, dried beans (excluding horse beans) and lentils

2 Imports are for calendar years, eg 1966 under 1966/7

3 Import figures cover all fresh fruit and vegetables ie they include tropical produce and citrus. Non-temperature fruits constitute over half United Kingdom fresh fruit imports

\* Less than 50 tons; value small; share less than 0.5 per cent

**Table 44 Supplies of certain fresh vegetables and fruit in the United Kingdom during the home marketing season/£ million**

	1962/3	1963/4	1964/5	1965/6	1966/7
<i>Fresh vegetables</i>					
Home output	85.7	88.2	95.9	94.8	101.2
Channel Islands supplies	10.5	9.7	9.6	12.8	13.2
Imports	28.0	26.7	27.6	29.7	27.8
<b>Total</b>	<b>124.2</b>	<b>124.6</b>	<b>133.9</b>	<b>137.3</b>	<b>142.2</b>
Home share (%)	69	71	72	69	71
Channel Islands share (%)	9	8	7	9	9
<i>Fresh fruit</i>					
Home output	47.2	43.6	50.5	46.8	47.0
Channel Islands supplies	—	—	—	—	—
Imports	11.7	12.5	13.8	15.9	17.1
<b>Total</b>	<b>58.9</b>	<b>56.1</b>	<b>64.3</b>	<b>62.7</b>	<b>64.1</b>
Home share (%)	80	78	79	75	73
<i>Total</i>					
Home output	132.9	131.8	146.4	141.6	148.2
Channel Islands supplies	10.5	9.7	9.6	12.8	13.2
Imports	39.7	39.2	41.4	45.6	44.9
<b>Total</b>	<b>183.1</b>	<b>180.7</b>	<b>197.4</b>	<b>200.0</b>	<b>206.3</b>
Home share (%)	73	73	74	71	72
Channel Islands share (%)	6	5	5	6	6

*Notes:*

1 The cropping year for home output and Channel Islands supplies is deemed to be June–May. In some cases the marketing period does not coincide with this 12-months' period and in those cases an appropriate marketing period has been taken.

2 Imports are for the marketing period appropriate for the home crop.

316 As well as imports of fresh produce there are also significant imports of processed fruits and vegetables. Table 45 summarises these processed imports; some of the items listed—such as canned, frozen and dehydrated potato—are derived from produce which is grown outside the horticultural industry. Later in the report attention is drawn to the main products where the home grower might gain a greater share of this processed food market.

317 Before examining in detail the scope for import saving by expanding home output of specific crops, the group wishes to point out that home growers have difficulty in the early part of the season in competing with producers of crops such as cucumbers, tomatoes and strawberries in climates which favour those

**Table 45 Imports of processed fruits and vegetables in the United Kingdom/  
£ million**

<i>Product</i>	<i>1962</i>	<i>1963</i>	<i>1964</i>	<i>1965</i>	<i>1966</i>
Jams, etc	1.0	1.5	0.8	0.8	0.9
Frozen fruits	0.5	0.7	0.6	0.5	0.9
Canned pears	8.3	7.7	8.6	7.0	8.7
Canned fruit salad	3.7	4.3	3.5	3.6	4.7
Canned soft fruit	1.6	1.6	1.1	0.8	0.9
Other canned fruit (excluding apricots, grapefruit, oranges, peaches and pineapples)	1.9	1.9	2.1	2.5	3.2
Canned apples without sugar	1.3	0.8	0.7	0.5	1.1
Strawberry pulp	0.7	0.8	0.4	0.3	0.4
Cherries in casks	0.5	0.4	0.4	0.5	0.5
Other pulp (excluding apricot)	0.8	0.6	0.6	0.5	0.8
Frozen vegetables	3.6	6.1	4.0	3.4	5.1
Dried vegetables	2.2	3.0	2.5	2.7	3.1
Pickled vegetables, etc	0.7	0.8	0.8	0.8	0.9
Canned vegetables, etc (excluding tomatoes)	2.7	3.1	2.7	2.5	3.4
Provisionally preserved vegetables	1.4	1.3	1.4	1.4	1.7

crops. British growers have been accustomed to rely on good prices for their early crops to cover a large proportion of their production costs, and if imports were limited at that season, home production would be stimulated, though the consumer might have to pay a higher price. Moreover, growers believe that, by bringing forward the marketing of a seasonal crop such as strawberries, early season imports reduce the demand for the home crop and as a result, lead to danger of falling home production and rising imports. These early season imports do not appear to be important nutritionally and only a small interference with the freedom of consumer choice would be involved if they were discouraged.

#### *Exports*

318 British horticulture's contribution to the balance of payments is largely confined to import saving, as the potential for exporting horticultural produce is limited. Most countries restrict their imports of horticultural produce, either to protect their domestic industries from foreign competition or to safeguard them against the risk of importing diseases. These barriers can be reduced only by Government action, but there is also a need for the industry to build up com-

mercial relations in potential export markets. Horticultural Exports (Great Britain) Ltd has been set up for this purpose, and the British Agricultural Export Council may well have an increasingly important part to play. It must not be overlooked, however, that the industry's contribution to exports in the past has probably been more in the provision of raw materials for the food processing industry than in the direct export of fresh produce.

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## Vegetables

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### *Trends in imports*

319 The value of total imports of fresh vegetables, other than those from the Channel Islands, increased by over £7m between 1962 and 1966, from £47.3m to £54.7m. Of this increase, £1.2m occurred in imports of vegetables which more properly belong to the arable rather than to the horticultural sector—dried peas, dried beans and lentils—and which account for just over one-fifth of the total vegetable imports. Of the remaining vegetable imports, costing £43.4m in 1966, tomatoes accounted for half at £22.1m—£3.8m higher than in 1962—while onions were next in value at £8.3m and little changed from 1962. Cucumbers were third at £3.2m and showed a very rapid expansion, imports in 1962 being valued at only £1.4m and in 1960 at only £0.7m. Other items of significance were lettuce and carrots: imports of lettuce, mainly grown under glass, rose from £2.4m in 1962 to £2.8m in 1966, but imports of carrots, at £2.4m in 1966 were £0.2m lower than in 1962. The group has examined the more significant import items in some detail.

### **Glasshouse vegetables**

#### *Tomatoes*

320 The British market for tomatoes has been virtually static during the 1960s, at just over 300,000 tons, but with a slight tendency to decline. Imports from foreign countries account for about one-half of the market and supplies from the Channel Islands for just under half the remainder. The home producer thus provides a little over one-quarter of the total market. Taking home produced and Channel Islands supplies together, these now provide the same proportion of the total market as in 1962/3, their share having recovered from the low point reached in 1963/4. During April–September, the main marketing season of the home glasshouse crop, the home and Channel Islands producers provide about two-thirds of total supplies. Although imports in 1966 were only slightly higher than in 1962 their cost rose from £18m in 1962 to £22m in 1966.

321 As population and incomes have risen during the 1960s, the static market has represented a shift in consumer demand away from tomatoes. The projections of the demand working group indicated that, assuming 1966 price relationships were unchanged, there would be little change in total demand for tomatoes by 1972, despite the expected rise in population and income. Moreover, the seasonality of the market has been changing and, within the import total, there has been a greater volume of imports during the winter months, from Spain and the Canary Islands in particular.

322 The group has noted that considerable progress is being made with the modernisation of glasshouses, assisted by the Horticulture Improvement Scheme. In its view, this process is making the home producer of tomatoes relatively more competitive during the summer season, and should improve his share of the market during the period April to September inclusive. Except in

**Table 46 Supplies of tomatoes in the United Kingdom/'000 tons**

	1962/3	1963/4	1964/5	1965/6	1966/7
Home output	82	76	82	79	80
Channel Islands supplies	67	51	59	63	68
Imports	152	163	166	164	155
<b>Total supplies</b>	<b>301</b>	<b>290</b>	<b>307</b>	<b>305</b>	<b>303</b>
Imports					
April–September	65	83	76	76	63
Home output as % of:					
Total supplies	27	26	27	26	26
Supplies April–September	38	35	38	36	38
CI supplies as % of:					
Total supplies	22	18	19	21	22
Supplies April–September	28	23	24	25	30
Value of imports (£m)	18.3	20.6	23.1	21.1	22.1

*Note:* Imports refer to calendar years, 1966 under 1966/7

Jersey, the climate is not suitable for tomatoes grown in the open as they would tend to compete with supplies of good quality tomatoes grown in the Valencia area of Spain. Nor would it be economic to attempt to compete with Canary Islands supplies by producing an out-of-season hothouse crop.

### *Cucumbers*

323 In contrast to tomatoes, the demand for cucumbers is buoyant, having risen from 37,000 tons to 53,000 tons during the 1960s. All of this increase has been provided by imports, which now cost over £3m annually. As with tomatoes, some of the additional imports have come from the Canary Islands in months when it is not economic to produce cucumbers in Britain. Competition from these imports has already brought down the prices of home-grown cucumbers in the early part of the season, particularly in March. In 1966, 10,000 tons were imported from all sources in the first and last quarters of the year taken together.

324 Imports have also increased during the main home marketing season—March to November—the total rising from 7,200 tons in 1962 to 18,700 tons in 1966. Holland has been the main supplier. Figures over a longer period show that the Dutch gained their entry to the British market during the mid-1950s, when they developed a new style of glasshouse which made possible a reduction of 40 per cent in the labour required. The consequent increase in profitability induced a large expansion in the area under glass. As a result of these trends, the home producers' share of the market has fallen from 79 per cent in 1962/3 to 57 per cent in 1966/7, though, as noted above, the size of the market has expanded greatly during this period.

Table 47 Supplies of cucumbers in the United Kingdom/'000 tons

	1962/3	1963/4	1964/5	1965/6	1966/7
Home output	32.0	31.7	30.3	33.0	29.8
Imports	8.6	14.8	19.2	20.4	22.8
<b>Total</b>	<b>40.6</b>	<b>46.5</b>	<b>49.5</b>	<b>53.4</b>	<b>52.6</b>
Imports March–November	7.2	12.9	16.3	17.0	18.7
Home output as % of:					
Total supplies	79	68	61	62	57
Supplies March–November	82	71	65	66	61

*Note:* Imports refer to calendar years, 1966 under 1966/7. Channel Islands supplies are negligible

### *Lettuce*

325 Imports of lettuce in recent years have been steady at around 11,000 tons. The great bulk of these imports have been grown in glasshouses and arrive in November–May. Allowing for seasonal variations, there is a fairly regular pattern of demand. In the last decade there has been a marked increase in the consumption of salads during the winter months and lettuce appears to have shared in this increase. In the seven months, November–May, home sources have provided rather more than half of total supplies. The Netherlands has supplied by far the greatest proportion of the remainder during this period, seasonal supplies from that source averaging about 10,000 tons, or about 93 per cent of all the imports received during the period. In terms of value, the proportion has been 97 per cent.

326 A survey carried out by the Dutch industry some ten years ago revealed this potential demand and also established that it could only be met economically in Northern Europe by heated glasshouse production. This enabled Dutch growers to take the lead in developing suitable varieties and growing techniques, and for a period Dutch lettuces, unlike their tomatoes and cucumbers, commanded a premium over home-produced lettuce in the British markets. However, this position is changing and British producers, notably the Land Settlement Association, by the production of a standard product and efficient marketing, are now supplying winter lettuce which is becoming competitive with the imported product. New varieties bred at the Glasshouse Crops Research Institute have helped to bring this about.

327 On the face of it, there does appear to be an opportunity for import saving here. However, demand during this period is limited and increasing production has brought prices down to a lower level. Two other major disincentives to greater production of lettuce under heated glass in this country have been the need to start main crops of tomatoes earlier, thus reducing the time available for lettuce, and the possibility of growing more profitable catch-crops, such as flowers. Nevertheless a saving in imports of winter lettuce is attainable and should be encouraged. The possibilities of expanding glasshouse production of lettuce are linked with an expansion of tomato production and are discussed in paragraphs 332–335.

**Table 48 Supplies of lettuce in the United Kingdom/'000 tons**

	1962/3	1963/4	1964/5	1965/6	1966/7
Home output	108.3	105.4	117.2	114.7	127.3
Channel Islands supplies	0.3	0.4	0.3	0.7	1.0
Imports	8.4	11.1	11.3	10.9	11.5
<b>Total supplies</b>	<b>117.0</b>	<b>116.9</b>	<b>128.8</b>	<b>126.3</b>	<b>139.8</b>
Imports					
November–May	8.2	10.6	11.0	10.5	11.2
Home output of glasshouse lettuce	9.2	10.4	10.1	11.6	12.5
Home output and Channel Islands supplies as % of total supplies	93	91	91	91	92
Home output of glasshouse lettuce and Channel Islands supplies as % of supplies during November–May	54	51	49	54	55
Value of imports (£m)	2.3	2.7	2.7	2.7	2.6

*Note:* Imports are for calendar years, 1966 under 1966/7

#### *Impediments to modernisation of glasshouse industry*

328 The foregoing review of the balance of home and imported supplies of tomatoes, cucumbers and lettuce provides a convenient opportunity to stress the important contribution which the modernisation of glasshouses can make both to the efficiency of the industry and to import saving through greater output. The fact that modernisation of glasshouses began later in Britain than in Holland has the advantage that a more up-to-date industry is emerging in Britain. Modern glasshouses equipped with automatic systems for controlling temperature, moisture and ventilation enable substantial economies to be made in the use of labour, particularly in cucumber growing but also in the growing of tomatoes and other crops. In the process, coal is being replaced by oil, and so adding to import costs. The resultant lower fuel costs, the freedom from pollution and the greater flexibility of operation obtained make this added import bill defensible, at least until such time as natural gas can be used as a source of fuel.

329 There are, however, three major impediments to the modernisation of existing glasshouses. First, to secure maximum efficiency in production it is essential that glasshouses should be located in the situations having the best natural light and other conditions favourable to plant growth. There are few such locations, and the reluctance of some planning authorities to permit the erection of new glasshouses in such places is sometimes an obstacle to progress. The group hopes that planning authorities will recognise the problem and will try to avoid placing impediments in the way of development of new glasshouses in 'high light' areas.

330 A second impediment also associated with planning procedures applies in green belt areas—particularly the Lea Valley, which still has the largest concentra-

tion of glass in the British Isles. Atmospheric conditions on the fringes of large cities are unsuitable for some glasshouse crops. The transfer of glasshouse businesses to more favourable areas would be accelerated if the owners were free to sell their present sites for other uses, particularly housing.

331 A third impediment arises from recent changes in taxation which tend to discourage investment in the industry and to lead to its fragmentation.

*Prospects for expansion in glasshouse foodcrops*

332 The group considers that the glasshouse foodcrop industry could make its best contribution to import saving by expanding the output of tomatoes, with a subsidiary contribution from lettuce. The bulk of imports of these commodities (tomatoes from April to September, lettuces from November to May) comes from the Netherlands. Rising costs of production there have reduced the profitability of growing these crops for export, while devaluation must also make our market less attractive to the Dutch exporter. At the same time, modernisation of glasshouses in this country (now proceeding at the rate of over 200 acres a year) should improve the competitive position of the home industry. Under favourable conditions, the group believes that it would be technically possible for the home industry to save £10m, representing 50,000 tons of tomatoes—a substantial proportion of imports at present entering the country between April and September.

333 If such an expansion were to be obtained, part of it would arise from increased production on existing acreage of glass, and part from entirely new acreage. Between August 1964 and March 1967, 568 acres of new or re-topped glass were erected, but since the total acreage remained static, it must be assumed that a corresponding acreage of old glass was taken out of production. Further, a major part of the new acreage was probably devoted to flower crops, but there is considerable evidence that flowers have reached saturation point for the moment, and that tomatoes may in the future become relatively more attractive to growers. The group estimates that the postulated expansion could be obtained by the modernisation of 1,000 acres of old glass plus the addition of 500 acres of new glass, bringing the glasshouse acreage back to the 1954 level. At £12,000 an acre for modernisation and £25,000 an acre for new glass the capital expenditure required would be about £24½m. Taking account of imported inputs, particularly fuel, used to produce the additional tomatoes, the net import saving would be about £9m if the additional output replaced a corresponding quantity of imported tomatoes and lettuce.

334 It would, however, be unrealistic under present conditions to expect to replace 50,000 tons of imported tomatoes within the next five years; but given the alterations in the relative costs of production and the terms of trade between the Netherlands and this country, it should be possible to replace some 15,000 tons, reducing imports from that country from the present annual level of about 50,000 tons to the 1958-60 level of under 35,000 tons, and imports of winter lettuce correspondingly. The resulting saving in foreign exchange would be about one-third the amount quoted in paragraph 333 *ie* £2½m-£3m a year. Assuming that the present modest rate of replacement of glass (5 per cent a year) is maintained, the 2,200 acres at present producing a tomato crop should be replaced by at least 100 acres of well sited heated glass a year, yielding each year an extra 1,600 tons of tomatoes, or an extra 8,000 tons by 1972/3. For the remaining 7,000 tons required to reach the postulated target of 15,000 tons only about 120 acres of additional glass would be required.

335 The capital cost of replacing existing glass is considered to be a cost which



will be incurred whether or not output expands and does not therefore have to be assessed in the context of expansion. It is thought that the additional costs, such as greater fertiliser usage to obtain the higher yields possible in the rebuilt glasshouses, will be small and offset by savings in labour. Higher marketing costs of say £½m a year will, however, be incurred.

336 The capital cost of 120 acres of new glass, at £25,000 an acre, will be £3·0m; depreciated over ten years this is equivalent to an annual charge of £300,000. Variable production costs are likely to amount to about £300,000 a year, and marketing costs to a little under £½m. The additional labour required is estimated at 300 men.

## **Field vegetables**

### *Onions*

337 Although the value of imports of onions has risen in recent years—from £6·1m in 1960 to £8·3m in 1966—the quantity (almost entirely dry bulb) has been fairly constant at a little over 200,000 tons. Home output of dry bulb onions has shown some recovery during the 1960s from the low level of the 1950s, reaching 60,000 tons in 1966/7 compared with only 18,000 tons in 1959/60. On husbandry grounds, a higher home output is feasible but the climate precludes the natural drying of the crop in many seasons; further inroads into imports are therefore unlikely without the widespread adoption of artificial drying techniques, perhaps on a co-operative basis. The group estimates that to increase home production of onions by 40,000 tons to 100,000 tons—a quantity well within the scope of the industry—would require an additional 3,000 acres of land, together with variable costs of about £70,000 annually and a total capital cost for drying and storage facilities of about £½–£1m. Net import saving from this expansion would be about £1½m a year.

338 The home acreage of green onions is some 30 per cent smaller than that of dry bulb onions, but the value of the crop, £2m–£3m, is considerably greater. There are no significant imports of green onions.

### *Cauliflower and broccoli*

339 Output of cauliflower and broccoli is now over 300,000 tons a year, valued at some £10m–£11m a year. The value of cauliflowers is about the same as, and sometimes even exceeds, that of cabbages, although the latter in quantity terms is the principal domestic field crop. Imports are fairly constant in value, but amount to only about 10 per cent of the market in volume terms.

340 Cauliflower and broccoli are a crop for which there is a good scope for replacing imports in the period February–April. There is plenty of suitable land, and very little would be required in additional capital. For an expansion in output of 20,000 tons, part replacing imports and part to meet increased demand, 3,700 acres would be required. To obtain expansion, it would be an advantage if more work could be carried out on plant breeding to provide varieties which would give a regular sequence of cutting through the season. Developments in chemical weed control are already proving of value in the growing of this crop. The group has noted that some growers are concerned that the new official grading regulations will hamper the marketing of the crop and so reduce the advantage the home producer has over his foreign competitors of economy in handling and speed of delivery from field to market.

### *Carrots*

341 A small quantity of carrots is imported annually. While it is insignificant

in relation to the volume of output of the home industry, it is high in terms of value. Home output fluctuates from 300,000 to 400,000 tons, valued at £4m-£5m; imports are usually only 20,000 to 40,000 tons, but their value is £1½m-£2m. Most of these arrive in April-June, mainly from Cyprus, but there are also imports of early season varieties, particularly from the Netherlands in the latter part of May and early June, and indeed small quantities arrive throughout the home season. The Americans gained an entry to the market after the severe winter of 1963, when imports rose to £5.2m and they have retained a small share of the market because of the regularity and attractiveness of their product and because it arrives mainly in the spring. In the view of the group, British growers are able to provide all the needs of the market, except at the end of the season when what is left of the home crop is not of the best quality.

342 To make any substantial inroads into the level of imports will not be easy under free market conditions. If new storage techniques could be devised which would improve the quality of the home crop at the end of the season, it would be more competitive with imports at this period and there should be some reduction in the volume of imports. The group recommends that there should be more research into methods of storage. Imports might also be reduced by greater development and use of cheap forms of protection, such as polythene, which would advance the marketing of the early home crop. More attention, too, should be paid to the growing of varieties which compete directly with imports. Finally, as canned carrots compare well with fresh carrots, greater use of canned carrots at the end of the season would also lead to lower imports. The extra demand would not require additional acreage, as home production is frequently in excess of market demand.

#### *Mushrooms*

343 Mushrooms provide an excellent example of the ability of the industry to meet new demands. Since the latter half of the 1950s acreage has doubled and output increased two-and-a-half times. It is now valued at over £8m. The growth of the market has inevitably attracted imports, but these amount to no more than £0.4m and the group is confident that the industry will be able to meet future increases in demand.

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### **Fruit**

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#### **Top fruit**

##### *Dessert apples*

344 Dessert apples provide the outstanding example of a crop which the British horticultural industry supplies for about eight months of the year and which, being easily transportable, is provided by southern hemisphere countries in their season; hence consumer interest in the product is maintained throughout the year. The domestic crop is protected by quotas on imports from all countries outside the sterling area, and in practice only Australia, New Zealand and South Africa can send apples without restriction. Taking the year as a whole, the home industry provides rather more than half of total supplies by volume, though only about 40 per cent by value. Imports fluctuate, often reflecting the size of crops in supplying countries, but they have been increasing and during the last three years have cost about £25m a year on average. If the marketing season for the home crop is taken to be August-March, imports provide about one-quarter of

supplies during this period. It is these imports which could be replaced to a greater or lesser extent by home production.

345 The dessert apple acreage reached a peak in 1957/8 at 65,000 and is now steady at 63,000 acres. Especially favourable weather gave a record output of 318,000 tons in 1964/5; output has since been much lower. Given average weather conditions, it is expected that by 1972/3 output could regularly reach at least 300,000 tons. This will be achieved without any increase in acreage—indeed, present indications are that the acreage will fall slightly below its existing level. Much replanting has gone on in recent years, the benefits of which, in terms of higher yields, will increasingly be obtained in the years ahead.

Table 49 Acreage and supplies of dessert apples in the United Kingdom, '000 acres and '000 tons

	1962/3	1963/4	1964/5	1965/6	1966/7
Acreage	63	63	63	63	63
Home output	245	274	318	289	258
Total imports	236	206	229	238	260
Total supplies	481	479	547	527	518
Imports					
August–March	70	85	87	100	100
Home output as per cent of:					
Total supplies	51	57	58	55	50
Supplies, August–March	78	76	78	74	72
Value of total imports (£m)	23.5	19.4	22.2	24.9	27.4

*Notes:*

- 1 Home output figures subject to review in light of 1966 Orchard Fruit Census. The trend is unlikely to be affected by any revision
- 2 Imports are for calendar years, 1966 under 1966/7

346 An increase in output to 300,000 tons, however, would be unlikely to result in an equivalent cut back in imports so long as present quota arrangements are in force. Demand is firm and some increase is expected as a result of rising population, income and consumption a head. This increase in demand might absorb about half the additional output, so that to make a major impact on imports, it would be necessary to expand home production to a level appreciably higher than 300,000 tons.

347 Such an expansion in output could not be achieved quickly: if the necessary planting were started immediately, its effect would only begin to be seen in 1972/3. There is, however, no technical impediment to an increase in production provided growers make full use of improved techniques, such as close planting of dwarfing stocks in a hedgerow system and provided also that they take care in the choice of site. In the latter connection, the work of the Meteorological Office and the National Agricultural Advisory Service will prove invaluable. There would be advantage to growers if the facilities for demonstrating new fruit-growing techniques were improved by the addition of an experimental horticulture station in the fruit growing areas and possibly by a closer linking of the

Ministry of Agriculture's experimental horticulture stations with the appropriate farm institutes run by local education authorities. As regards the varieties to be grown, concentration will tend to be on the late-season and longer-keeping varieties: there would also be import-saving possibilities if supplies of a red variety could be made available towards the end of the year to provide for a demand that is at present met by apples from North America.

348 Under present market conditions, the rapidly growing output elsewhere in Europe means that the United Kingdom import quotas will be fully taken up almost irrespective of prices on the British market. Thus, the group could not recommend an expansion in home output to a level appreciably higher than 300,000 tons unless there were an assurance that imports would be correspondingly reduced, either by alteration in the quotas or by other means. This is because of the high initial capital investment necessary. For example, to increase production by a further 50,000 tons a year (*ie* about half the present level of imports in the August-March period) would require the planting of 8,000 acres of land which, at £500 planting cost an acre, would call for an investment of £4.0m. Furthermore, as present fruit storage capacity of 240,000 tons on farms or owned by co-operatives is already fully used, there would have to be an investment of £3.0m for storage facilities if the additional home production were to replace imports in January-March rather than merely add to the already plentiful supplies available from August to December. Depreciating the capital cost over ten years, the capital requirement would be equivalent to an annual capital charge of £0.7m; in addition there would be £1.0m annual variable costs for fertilisers, sprays, packaging, *etc.*, and some further costs for marketing.

#### *Culinary apples*

349 The home industry provides virtually all the needs of the market for fresh culinary apples, though there are imports of processed fruit. The acreage is steadily falling—it has dropped more than one-quarter during the 1960s to 45,000 acres in 1966. Output, weather conditions apart, has been well maintained even though there has been little replanting, and a peak 286,000 tons were produced in 1964/5. The weakness of this sector of the top fruit industry is the susceptibility to frost of its principal variety, Bramley's Seedling. Much of the acreage is in Kent on land liable to frost. A valuable increase in output could be obtained by grubbing these orchards and taking advantage of the meteorological information now available to plant on more suitable sites.

350 The group believes that demand for Bramley's Seedling, a variety which is exceptionally suitable for processing, will increase because of the increasing popularity of prepared foods. There is also the possibility of exports to Continental Europe, where no apple of comparable quality is now produced. The profit per acre to the grower from culinary apples is approaching that from dessert apples and should provide sufficient encouragement for the expansion of the crop in suitable locations. There is room for an increase of about 1,000 acres a year for the next five years, the planting of which will require an investment of £1.25m; depreciated over ten years this is equivalent to £125,000 a year.

#### *Cider apples*

351 The home crop normally provides the bulk of the apples used in the cider industry, but even in years of very heavy imports, such as 1967, when home supplies are low, the cost of imports is unlikely to reach £500,000. Acreage, which has fallen by nearly a half in the last fifteen years, was down to about

25,000 acres in 1966. Output, which fluctuates considerably, has also tended to fall. Prices realised for cider apples have not encouraged new plantings and there is no reason to expect an expansion in acreage unless the profitability of the industry is markedly increased. Steps to obtain greater regularity of output would make a minor, though useful, contribution to import saving. In view of the price levels envisaged, the group would give cider apple production a lower priority than other forms of top fruit production competing for the available resources.

### Pears

352 Apart from the exceptional year 1966/7, the British grower has provided 40-50 per cent of total supplies of pears. The home pear industry is protected by import quotas in the same way as apples (see paragraph 344). The home crop, which is marketed from August-February, normally provides about 70 per cent of supplies during this period. Imports are received mainly from Italy, Australia and South Africa. They cost about £6m-£7m a year.

353 The pear acreage is now steady at 17,000 acres; yields are improving though weather conditions have been unfavourable in the last two to three years. The three main varieties are Conference, Comice and Williams. Comice is an excellent quality dessert pear, Conference being a good canning and dessert pear. Williams is also a good canning pear, but does not compare with the Italian Williams as a dessert variety, being difficult to ripen satisfactorily in most seasons.

354 There is a big potential demand for Comice and Conference pears, especially Comice, and the group considers that a much larger acreage of these varieties should be grown. The chief inhibiting factor, as with apples, is confidence in the long-term profitability of the industry. Also, as with apples, even if an expanded acreage were planted immediately, returns would not begin to appear before 1972/3. To produce an additional 25,000 tons of pears and so to replace imports in the latter part of the home season, *ie* in October-February,

**Table 50** Acreage and supplies of pears in the United Kingdom/'000 acres and '000 tons

	1962/3	1963/4	1964/5	1965/6	1966/7
Acreage	16.6	16.7	17.1	17.1	17.2
Home output	50	61	67	68	41
Total imports	73	57	67	51	79
Total supplies	123	118	134	119	120
Imports					
August-February	31	31	32	30	36
Home output as % of:					
Total supplies	41	52	50	57	34
Supplies, August-February	62	67	68	69	53
Value of total imports (£m)	6.8	5.2	6.3	5.6	7.7

*Note:* Imports are for calendar years, 1966 under 1966/7.

and to meet an expected increase in demand, would require 4,000 acres of land, an annual variable cost of about £0.5m, and a total capital cost for planting and storage capacity of about £3.1m. Depreciating the capital cost over ten years the annual capital cost would be £0.3m.

355 The siting of the additional acreage recommended will have to be chosen carefully, as suitable locations in Britain for growing existing varieties are limited and there is a great need for new varieties better adapted to British conditions.

#### *Cherries and plums*

356 Cherries and plums are the only two remaining top fruits of significance. Both are in decline. Many cherry orchards have been rendered unprofitable because of disease; costs of production, particularly harvesting costs, have risen, but selling prices have not increased correspondingly. Thus, both acreage and output have fallen substantially. Imports are not large, usually about £4m a year. Much effort is going into the development of means of controlling bacterial canker and eliminating virus; if successful, they should enable new varieties of high quality, already available, to reinvigorate the industry. Attention has also to be paid to cheapening the harvesting process, whether by developing a more dwarfing stock or a method of mechanical harvesting.

357 Changing demand away from jam is the main cause of the decline in acreage and output of plums, and as a result there has been little research into breeding and husbandry methods. More dessert plums are being grown, but plums tend to fluctuate in cropping from year to year more than other fruits and research into methods to even out these variations is desirable. If the fluctuations could be overcome, the home industry would be able to supply a greater part of the market during August, September and October, as the British climate is suitable for growing and finishing this crop. New varieties might also help to reduce imports, which are now costing nearly £2m a year. Italy, Spain and South Africa are the main suppliers.

#### *Top fruit breeding research*

358 Varieties of top fruits respond differently to environmental conditions and the use of varieties that yield heavily under particular conditions confers a comparative advantage on local growers. Most of the varieties of top fruits now being grown commercially were selected in Britain long ago, and many of them now fall short of modern requirements in their yield, appearance, resistance to diseases and pests, time of ripening and other attributes. Countries which are in competition with Britain are putting much effort into breeding varieties that are better suited to their own conditions but, regrettably, insufficient work is now being done on top fruit breeding in Britain. Fruit breeding is admittedly expensive and slow, but the cost is small compared with the long-term benefits that could stem from a successful breeding programme that produced, for instance, a high quality red eating apple, suitable for long-term storage and with more regular yields. The group believes that there is a strong case for a significant increase in the effort devoted to top fruit breeding in the United Kingdom and the present programme should be reviewed as a matter of urgency. The alternative is likely to be a progressive rise in fruit imports in the years ahead.

#### **Soft fruit**

359 The value of home output of soft fruits in 1966/7 was estimated at £13.7m. Strawberries are the principal soft fruit, accounting for about half the total, followed by blackcurrants and raspberries. The total soft fruit acreage has

fluctuated between 46,000 and 51,000 acres during the 1960s, but the possible beginning of a downward trend was evident in 1965 and 1966. The strawberry acreage was well maintained, but there was an appreciable fall in acreage of blackcurrants in these two years. Total output of soft fruits reached a post-war peak in 1963 and 1964 at almost 100,000 tons. There was some decline in 1966: output of strawberries was at a record level, but the blackcurrant output fell dramatically from the high levels of the previous three years.

360 It is not possible to make a precise comparison between home output and imports, as much of the soft fruit imported has been subjected to some degree of preservation or processing and full details are not available. Imports of fresh soft fruit in 1966 cost £700,000, slightly more than in the three previous years, whilst other soft fruit imports (preserved or processed) probably cost about £3m-£4m. Fresh strawberries cost over £400,000; most of these imports arrive in May and early June, before any substantial supplies of home-grown strawberries are available. The home industry cannot compete economically with these supplies from countries with more favourable climates; if they were limited, there would be a more attractive early market for the home producer. Moreover, growers believe that these imports tend to reduce demand for the main home crop when it appears a few weeks later, and so discourage the domestic production of strawberries.

361 There are also imports of temporarily preserved strawberries, worth £420,000 in 1966 (3,900 tons) imported predominantly for manufacturing purposes. This manufacturing market gives more scope for import substitution than the fresh strawberry trade, as food processors already take about 40 per cent (14,000 tons) of the strawberry crop. Expansion to replace these imports is well within the capacity of the industry, but is largely dependent on the willingness of processors to pay remunerative prices.

362 The group noted that, after strawberries, blueberries were the only other fresh fruit imported in significant quantities. The £235,000 worth imported fresh was supplemented by an appreciable but unknown share of the £940,000 worth of imported frozen fruits, and possibly also by imports in other preserved forms. Trials of American highbush blueberries have shown that there are suitable soils in parts of Dorset, Hampshire and Surrey where this fruit can be grown successfully. There is little doubt that a market could be found for home-grown blueberries, and whilst it would take some time for a relatively unfamiliar crop to become established and would need much help from the National Agricultural Advisory Service, the group would like to see more effort made to grow this fruit in Britain.

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### **Flowers, bulbs, nursery stock**

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363 Attention was drawn in the introductory paragraphs to the growth of one-third in the recorded output of this sector of the horticultural industry between 1962/3 and 1966/7, though the statistics may exaggerate the actual increase in output. At the end of this period output was valued at £40m. The increase of £10m was shared equally between cut flowers and nursery stock, the output of the latter increasing by nearly half by value. As far as flower bulbs are concerned, the small and relatively stable output figure masks the existence of a very large home production worth £11m, since for statistical purposes 'output' comprises only bulbs which are sold for uses other than for further commercial horticultural production. Thus, by far the greater part of home production of

bulbs represents an important input item in the output of non-edible horticultural products. Illustrative of the expansion of bulb production which has taken place is the fact that Britain now grows more than twice the Dutch area of narcissus and daffodil bulbs.

364 The contribution of the Channel Islands to total supplies of cut flowers and foliage on the United Kingdom market is an important and increasing one. Between 1962/3 and 1966/7 Channel Islands supplies have increased by 40 per cent to £4.5m. To all intents and purposes this must be regarded as an extension of home output since it is not included in the statistics of the external trade of the United Kingdom.

365 It is difficult to make a detailed comparison of home output of non-edible horticultural products in relation to imports. In total, imports have remained fairly constant at around £10m a year, but included in this figure are items like cut foliage of kinds which cannot be grown in the United Kingdom and mushroom spawn which cannot be evaluated because they do not have to be entered separately by importers. Mimosa, imports of which are separately recorded, is another product that cannot be grown commercially in this country. Total imports of cut flowers and foliage, of which carnations at about £0.4m are the largest single item, have increased from £1.2m in 1962/3 to £1.6m in 1966/7. However, imports account for only 5 per cent of total supplies of cut flowers and foliage. There has been an increase of £0.6m in imports of nursery stock and similar items to £3.3m, or about 17 per cent of total supplies, but it should be remembered that the import figures include mushroom spawn, whereas those for home output do not. Rose stocks now account for nearly £0.6m against just over £0.3m five years ago and, since they are the raw material for British rose-growers, indicate the great expansion which has taken place in the commercial production of rose trees in the United Kingdom. The rose stocks themselves could, however, be grown in Britain. The fall in imports of flower bulbs of £1.5m since 1962/3 confirms the increasing self-sufficiency of this sector of British horticulture. Tulip imports have fallen from the high level of £2.1m in 1962/3 to £1.2m in 1966/7 and narcissus and daffodil imports from £1.0m to £0.5m.

366 It is interesting to note that while annual imports of bulbs rose for three years after the trade was liberalised, a progressive decline began following the 1962/3 season of peak imports. The home industry, encouraged by the Government to seek an arrangement with its opposite number in the Netherlands to regulate this trade, successfully concluded a gentlemen's agreement with the Dutch trade interests concerned whereby, in the interest of preventing the excessive oversupply of the British market, the Dutch would exercise export controls in the form of annual minimum prices set in consultation with British growers and distributors of bulbs. Dutch growers and exporters have thus avoided losses of the kind they sustained before the war through overloading the British market, while British growers have had confidence to expand their production. The British balance of payments has gained in consequence. There may be opportunities elsewhere for the adoption of this approach to import saving.

367 The increase in home output of flowers and nursery stock shows the flexibility of the industry in adapting to new circumstances. Practically the whole of the increase in the demand for these items has been met by the home industry, which has tended to switch from less profitable production. In this way a more efficient use of national resources has been obtained. The group is satisfied that the home industry will continue to meet the bulk of the demand in



this sector which might rise by £5m by 1972/3. As most of the additional output will come from increased yields the capital and variable costs would be comparatively small.

**Table 51 Supplies of flowers, nursery stock and bulbs in the United Kingdom/£ million**

	1962/3	1963/4	1964/5	1965/6	1966/7
<i>Cut flowers and foliage</i>					
Home output	18.4	19.8	22.0	22.2	23.3
Channel Islands supplies	3.2	4.1	3.8	4.3	4.5
Imports(a)	1.2	1.4	1.3	1.5	1.6
<b>Total supplies</b>	<b>22.8</b>	<b>25.3</b>	<b>27.1</b>	<b>28.0</b>	<b>29.4</b>
Home share (%)	81	78	81	79	79
Channel Islands share (%)	14	16	14	15	15
<i>Hardy nursery stock</i>					
Home output	11.2	13.1	15.3	16.8	16.0
Channel Islands supplies	—	—	—	—	—
Imports(a)(b)	2.7	2.9	3.3	3.3	3.3
<b>Total supplies</b>	<b>13.9</b>	<b>16.0</b>	<b>18.6</b>	<b>20.1</b>	<b>19.3</b>
Home share (%)	81	82	82	84	83
<i>Bulbs, etc. (c)</i>					
Home output(d)	0.9	1.1	0.7	0.7	0.7
Channel Islands supplies	—	—	—	—	—
Imports(a)	6.4	5.4	5.8	5.1	4.9
<b>Total supplies</b>	<b>7.3</b>	<b>6.5</b>	<b>6.5</b>	<b>5.8</b>	<b>5.6</b>

(a) Imports are for calendar years, 1966 under 1966/7.

(b) £0.4m included for each season in respect of 'Buds, eyes and stems for grafting and budding; cuttings and slips; mushroom spawn.'

(c) Including tubers.

(d) Figures relate to output of bulbs for sale. Total production is valued at about £11m; hence figures of output do not reflect the home industry's major contribution to the total usage of bulbs in the United Kingdom.



# Appendix 1

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## Economic Development Committee for the Agricultural Industry

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### *Chairman*

Sir Edmund Bacon      Formerly chairman, British Sugar Corporation

### *Members*

Professor D K Britton	Department of Agricultural Economics, Nottingham University
Lord Collison	General secretary, National Union of Agricultural Workers
J A Davies	Farmer
B Aitken	Department of Economic Affairs
T Healy	National secretary, Agricultural Section, Transport and General Workers Union
DF Hodsdon	Assistant general secretary, National Union of Agricultural Workers
M Joughin	Farmer
Miss J Maynard	Vice-president, National Union of Agricultural Workers
J A Montgomery	Farmer
J R Moss	Ministry of Agriculture, Fisheries and Food
Sir Peter Runge	Joint vice-chairman, Tate and Lyle Limited
CH Shillito	National Economic Development Office
A E W Steen	Ministry of Agriculture, Northern Ireland
NE Strutt	President, Country Landowners' Association
H Whitby	Department of Agriculture and Fisheries for Scotland
GT Williams	President, National Farmers' Union
A Winegarten	Chief economist, National Farmers' Union
GC Wyndham	Vice-chairman, Europe, Country Landowners' Association

### *Secretary*

G Haydock      National Economic Development Office

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## Demand Working Group

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### *Chairman*

J G Fisher                      Department of Economic Affairs

### *Members*

C J Brown                      Ministry of Agriculture, Fisheries and Food

Professor J A C Brown      University of Bristol

A J Carrington              Department of Economic Affairs

Professor P E Hart          University of Reading

C H Shillito                  National Economic Development Office

R Silverman                  National Farmers' Union

Alderman J M Stewart      National Union of Agricultural Workers

M Strauss                      National Farmers' Union

### *The following also attended meetings of the group:*

L J Angel                      }  
A H J Baines                  }      Ministry of Agriculture, Fisheries and Food

R J Wheeler                  National Economic Development Office

J Birch                          Trades Union Congress

### *Secretary*

G Haydock                      National Economic Development Office

### *Assistant secretary*

N H T Cooper                  National Economic Development Office

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## Arable working group

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### *Chairman*

N E Strutt                      Country Landowners' Association

### *Members*

Dr G D H Bell	Plant Breeding Institute, Cambridge
Dr K Dexter	Ministry of Agriculture, Fisheries and Food
G F Elston	National Farmers' Union
J G Jenkins	Farmer
C Morris	National Union of Agricultural Workers
Lord De Ramsey	Country Landowners' Association
I G Reid	Wye College, University of London
C H Shillito	National Economic Development Office
E L Snowden	Ministry of Agriculture, Fisheries and Food
M Strauss	National Farmers' Union

### *The following also attended meetings of the group:*

J A Anderson	}	Ministry of Agriculture, Fisheries and Food
B I Felton		
M D M Franklin		
H Pease		
L J Smith		
P J S Walder		
R Wentworth		
H Burt	}	National Farmers' Union
R C Butler		
J H Cossins		
G A Lewis		
P Savory		
A F Shaw		
A A Arbuckle	}	National Farmers' Union of Scotland
A G Dewar		
W G Mathewson		

J Rowsell                      Farmer

### *Secretary*

G Haydock                      National Economic Development Office

### *Assistant Secretary*

N H T Cooper                      National Economic Development Office

*The following organisations and persons gave evidence:*

R Taylor O S Rose R J M van der Burg	}	British Sugar Corporation
G S Bishop		Booker Bros. McConnell and Co Ltd
Dr R A Dunning		Broom's Barn Experimental Station
J K Backhus		Faure and Fairclough Ltd
J B Carr		Fertiliser Manufacturers' Association
J T Creighton H V Peake	}	Fisons Ltd
R L Wetherall D Bates J McMullen G Beardsley J W Bundy J C M Stead E Hall K J Nightingale	}	Food Manufacturers' Federation
Sir Charles Norman J Macaulay J W Pugsley F T Rees	}	Home-Grown Cereals Authority
J A Collier J P Johnson W J M Strong M W Tuck	}	Imperial Chemical Industries Ltd
B C Read J D Hutchison C L Copeland	}	National Association of British and Irish Millers
N A H Kitchiner Dr Clare Burgess A D Bird	}	National Association of Compound Animal Feedingstuffs Manufacturers
G B Woods P J Ottino	}	National Association of Corn and Agricultural Merchants
J Maggs R A Humphris	}	National Council of Concentrate Manufacturers
C A C de Boinville A E Peel	}	National Seed Crushers' Association
A J D C Loch D H Burgess	}	Potato Marketing Board



*The following organisations and persons gave evidence:*

Dr R Agarwala J Getty M M Guter E M Low	}	British Egg Marketing Board
S R Blackley		British Wool Marketing Board
A Blyth Dr J M M Cunningham	}	Edinburgh and East of Scotland College of Agriculture
Lt-Col U Corbett R G Dring	}	Federation of British Poultry Industries
Dr C R W Spedding		Grassland Research Institute
R L Reid J Eadie	}	Hill Farming Research Organisation
J A Collier J A Clark J P Johnson C E K Scouller M W Tuck	}	Imperial Chemical Industries Ltd
E Strauss E D Ashton R E Williams	}	Milk Marketing Board
S A C David J C Oliver	}	National Agricultural Advisory Service
C Ball Dr T L Dodsworth	}	North of Scotland College of Agriculture
G R Oake R A Mackness H Marks	}	Pig Industry Development Authority
M H Dummer		University College of Wales, Aberystwyth
J B McCreath		West of Scotland Agricultural College
H G Munro		National Farmers' Union of Scotland



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## Horticulture Working Group

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### *Chairman*

J A Montgomery                      Farmer

### *Members*

The Hon J Addington	National Farmers' Union
R V Allen	Ministry of Agriculture, Fisheries and Food
Dr R R W Folley	Wye College, University of London
E H Gardener	National Farmers' Union
Professor J P Hudson	Agricultural and Horticultural Research Station, Long Ashton
J W S Mount	Country Landowners' Association
L V Pike	National Union of Agricultural Workers
A G Sellers	National Farmers' Union
C H Shillito	National Economic Development Office
E L Snowden	Ministry of Agriculture, Fisheries and Food

### *The following also attended meetings of the group:*

A H J Baines	}	Ministry of Agriculture, Fisheries and Food
J R Catford		
K W Wilkes		
G R Woodward		
B F Meering		National Farmers' Union

### *Secretary*

G Haydock                      National Economic Development Office

### *Assistant Secretary*

N H T Cooper                      National Economic Development Office

### *The following organisations and persons gave evidence:*

R H Clements	}	Meteorological Office
L P Smith		
A E Allen		(representing Mr M W Hatto of G M Gerrards (Fruiterers) Ltd—multiple retailer)
B F Pratt		(B F Pratt Ltd—wholesale fruit and potato merchant)
J Candia		(United Fruit Shippers Ltd—importer and primary wholesaler)

*Chairman*

D F Hodsdon                      National Union of Agricultural Workers

*Members*

R S Butler                      Agricultural, Horticultural and Forestry Industry Training Board

Dr K Cowling                      University of Warwick

T Healy                      Transport and General Workers' Union

D J Kirkness                      Department of Economic Affairs

G Sharp                      Ministry of Agriculture, Fisheries and Food

H S Sharpley                      National Farmers' Union

C H Shillito                      National Economic Development Office

R Silverman                      National Farmers' Union

Professor W J Thomas                      University of Manchester

R Watson                      National Farmers' Union

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Dr K Dexter	}	Ministry of Agriculture, Fisheries and Food
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G Haydock                      National Economic Development Office

*Assistant Secretary*

N H T Cooper                      National Economic Development Office

*The following persons gave evidence:*

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D Metcalf                      London School of Economics

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G H Peters                      University of Liverpool

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# AGRICULTURE'S IMPORT SAVING ROLE

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A report by the Economic Development  
Committee for the Agricultural Industry

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LONDON  
HER MAJESTY'S STATIONERY OFFICE 1968

*The Economic Development Committees are composed of representatives of the three parties involved in industrial and economic development—management, trade unions and government—together with independent members. Their secretariat is provided by the National Economic Development Office, which is an independent, publicly financed body. This report has been prepared for publication by NEDO on behalf of the EDC for Agriculture which is solely responsible for its contents. For administrative convenience the booklet is printed and published through HMSO.*

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# Foreword

*To:*

**The Rt Hon Peter Shore, MP,  
Secretary of State for Economic Affairs**

**The Rt Hon Cledwyn Hughes, MP,  
Minister of Agriculture, Fisheries and Food**

**The Rt. Hon William Ross, MP,  
Secretary of State for Scotland.**

**The Rt. Hon James Callaghan, MP,  
Secretary of State for Home Affairs.**

We first met together as an Economic Development Committee in December 1966 and decided that we should start by concentrating on the role of British agriculture in the period to 1972/3 and on its potential contribution to import saving. To undertake the detailed studies required we appointed six working groups: one group was asked to measure changes in the demand for food by 1972/3 and three groups (arable, livestock and horticulture) to examine the supply possibilities. The other two groups were concerned with the manpower implications and with the general economic aspects of the study.

The membership of the groups comprised representatives drawn from the constituent bodies of the EDC, together with independent experts. Evidence was provided by the main agricultural and food manufacturing organisations and by a number of individual firms and persons connected with the industry. A list of those who took part is appended. We are grateful to them all and wish to record our indebtedness to them for their help.

We submit this report in the belief that, on the basis of the assumptions taken, it presents a realistic and practical statement of agriculture's potential contribution to the economy by 1972/3. We hope, therefore, that it will provide a guide in determining longer-term policy for the industry. We hope too that it will prove to be of use to the House of Commons Select Committee on Agriculture, which is currently pursuing a related enquiry.



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